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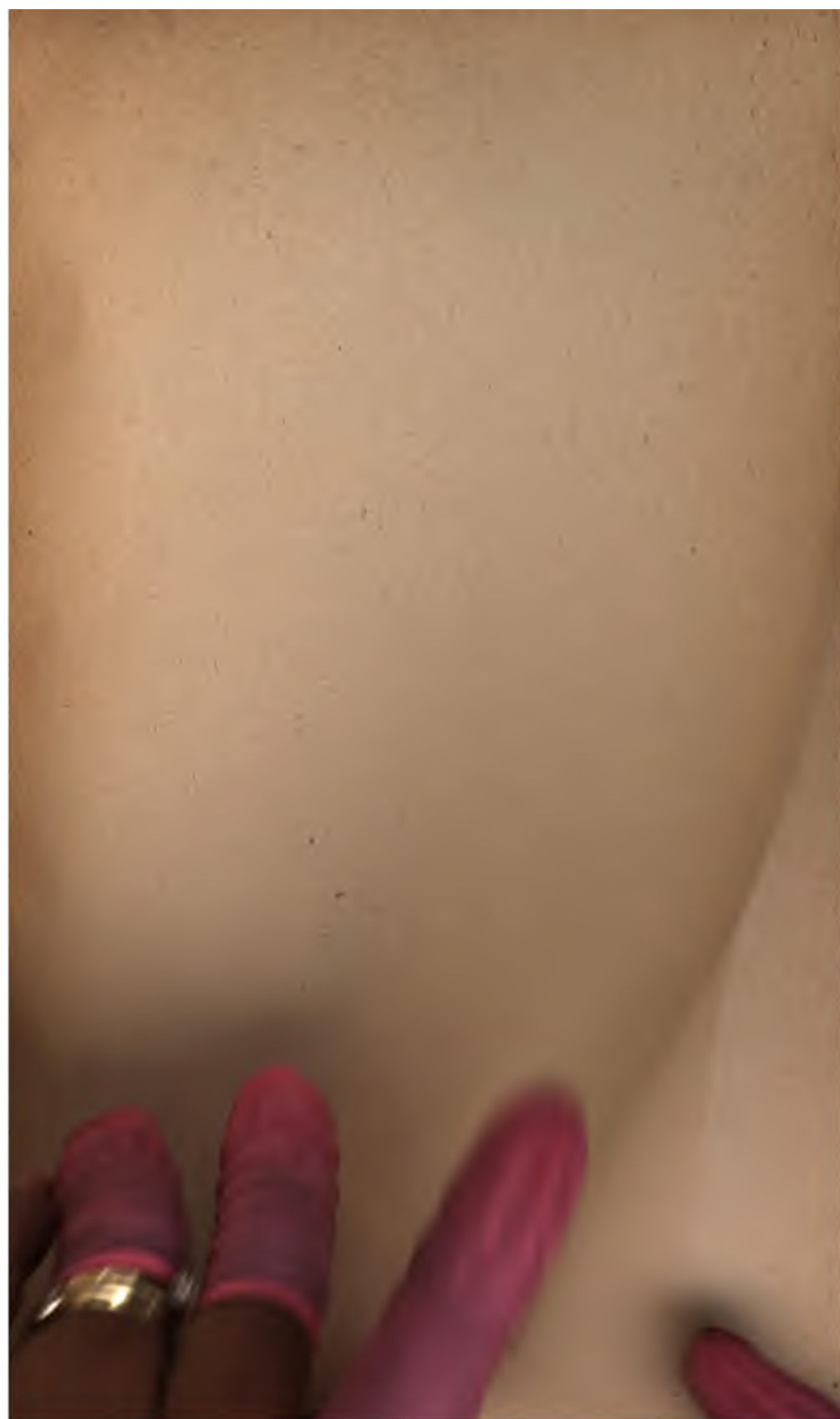


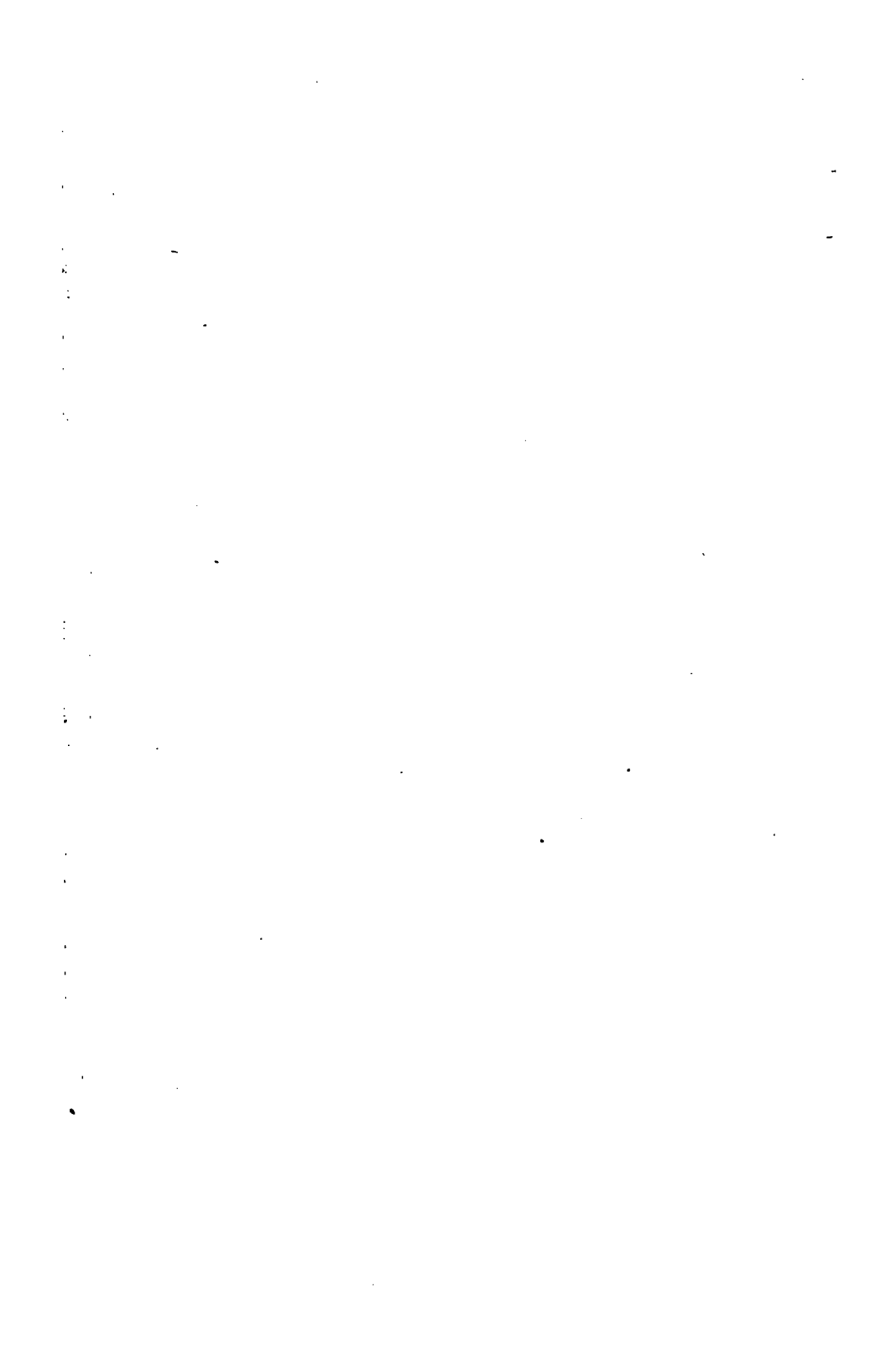












THE ANNUAL REPORT  
OF THE  
★  
INSPECTOR OF MINES

OF THE  
State of Kentucky,

FOR THE YEAR 1900.

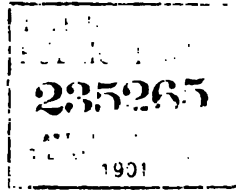
G. W. STONE, INSPECTOR.  
C. W. LOGAN, ASSISTANT.

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LOUISVILLE, KY.  
GEO. G. FETTER PRINTING CO  
1901.





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18

## LETTER OF TRANSMITTAL.

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*To His Excellency, J. C. W. BECKHAM,*

*Governor of Kentucky:*

Sir: I have the honor to submit herewith my fourth annual report as Inspector of Mines, covering the calendar year 1900, and being the ~~seventeenth~~ <sup>seventeenth</sup> annual report of this office. I trust that it will receive your approval, and be found worthy of consideration by the public.

Mr. C. W. Logan, the Assistant Inspector, has been very efficient and faithful in the performance of his official duties, and his splendid services should merit for him continued confidence and praise.

I beg to further acknowledge many favors shown this office by the trustees and officials of the State College, and again express to them my grateful appreciation for the same.

I desire also to thank you most sincerely for the interest you have taken in the work of this department, and for the constant courtesy you have manifested to its officials, and wishing you the greatest success in administering the duties of your high office, I have the honor to be,

Your obedient servant,

G. W. STONE.

Inspector of Mines.

Lexington, Ky.

B. 1. 2. 3. 4.



## GEOLOGICAL SURVEY.

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The work of this department has been steadily increasing for several years past, and a proportionate increase of time and labor are required for the necessary performance of its varied duties. Its importance to the State on all industrial lines is not fully understood, and therefore not properly appreciated by most of the people, but an insight into the correspondence of this office, in all its extent and character, would readily disclose to them much of its real value. This correspondence is not confined to home people, but much of it comes from other States of the Union, and some from foreign countries, and embraces nearly every line of mineral inquiry, and it imposes burdens of thought and time and patient examination of office records, that satisfactory answers may be given.

The hunt for minerals of every kind known, and of many unknown to our State, continues without abatement, and every publication and possible source of information are eagerly sought by those in search of such knowledge. No section of the State is exempt from these inquiries, but the Eastern portion, from the Ohio river to the Tennessee state line, and reaching far out into the interior, claims more attention, perhaps, than all other portions combined, but other sections come in for a fair share of the general investigation.

During the year numerous specimens were sent to this office for examination or analysis, but most of them were of no value. In connection with this branch of my work, I take pleasure in saying I received valuable assistance from Dr. Alfred M. Peter, of the Kentucky Experiment Station, State Chemist; and from Prof. Arthur M. Miller, of the State College, for all which I express to them my sincere thanks.

The coal deposits of the State are more extensive and are better known, because more fully published and developed than others, and form the basis of a great and permanent mining industry, that is destined to grow in the coming years to mammoth proportions, and dispense its numerous benefits to the people in measures now unthought of, for great as it now is, it is but in its infancy, and is capable of enormous expansion, and to this end it should be fostered with peculiar care. Numerous mines, some in former fields and others in new territory, are being opened, and their products thrown on the markets of the country.

However, it is for some of the lesser minerals that there is the most active inquiry and explorations. Different sections are showing up immense quantities of oil and gas, rock asphalt, lead, etc., until I am convinced that in the near future they will develop into astonishing amounts and values.

Numbers of visitors from this and other States have made personal visits to this office to examine the office copies of several volumes of the Geological Survey, in search of desired information, because there are left no such volumes for distribution or sale, and are therefore practically out of print. This is a great hindrance to the speedy and effective work of the office, and is a condition of things that ought not to be, and surely will not be allowed to continue, but if so, it will be a humiliating reflection on the good name of our State, and an exhibition of shameful parsimony, wholly indefensible, and never before heard of in a progressive government. I think the legislature ought to make an appropriation sufficient to restore all of these exhausted publications to the public use. The cost of reprinting them would be only a trifle, in comparison to the original cost of the work in the field and in the office in getting them up. I notice that of the four large volumes containing the invaluable research and labors of Dr. David Dale Owens, State Geologist, from 1854 to 1860, and of his corps of able assistants, none are left except a few copies of volume 4. These constitute the bases and main structure of the geological literature of the State, and are indispensable to its per-



petuation and usefulness. In addition to these, the five large and later publications, the work of Prof. N. S. Shaler, director of the State Survey, and of his assistants, and of great value to the State, are also exhausted.

The supply of State maps, and of the maps of different sections and counties, are also entirely exhausted. These ought to be corrected to date and reprinted in great numbers, to avoid harm to the public interest. To indicate the constant demand for them, I mention the fact that in connection with other State publications, numbers of them, many years ago, were consigned to the Robert Clark Company, of Cincinnati, Ohio, for sale on agreed terms of commission. An invoice of the stock on hand, September 2, 1900, as given this office by the said company, showed on hand, at that time, State maps as follows: 15 large linen maps, 75 cents each; 9 large geological maps, \$1.00 each; 2 paper maps, 50 cents each; and 208 small geological maps, 30 cents each. There were also in stock 99 maps of Southeastern Kentucky worth 25 cents each. All of these were sold by March 6, 1901, and there has been no let up in the demand for them, as is shown in the following letter to this office by the said company:

Cincinnati, Ohio, March 6, 1901.

Mr. G. W. Stone, Curator of the Geological Survey, Lexington, Ky.,

Dear Sir: We have recently closed out our stock of maps as follows:

Preliminary Geological map of Kentucky. Col.  $13\frac{1}{2}$  by  $25\frac{1}{2}$ , 30 cents.

Preliminary of Southeastern Kentucky. 20 by 21, 25 cents.

Large Geological map about 36 by 48, \$1.00.

We find quite a large demand for the two preliminary maps as above. Have you the plates or stone, and is there any way by which more can be printed? Our circulars have been so widely distributed that orders are coming to us from all parts of the world. The imprint on the maps is Julius Bien & Company.

Yours very truly,

The Robert Clark Co.,

R. D. Barney, Pres.

I have never seen these plates and know nothing as to their whereabouts. They may yet be in the possession of Bien & Company or their successors.

In my opinion there ought to be a partial revival of the State Geological Survey. The original survey never covered all the State, and much of the territory embraced should be reworked. I think it more profitable to operate it in certain sections, and on certain lines of inquiry. In fact it might be well to confine it altogether to the oil, gas, asphalt, lead and fluor spar sections of the State.

Recent discoveries and experiments indicate that there are in reserve vast and valuable deposits of all these minerals. I mention Carter, Rowan, Bath, Lawrence, Martin, Johnson, Floyd and other counties in that section, and Wayne, Pulaski, Cumberland, Clinton and other counties in that section; and Meade, Breckenridge, Grayson, Edmonson, Warren, Butler, Logan and other counties in that section, and Scott, Bourbon, and Crittenden counties and adjacent territories, as containing some of these deposits in great abundance. The State owes it to the public for the discovery and authentic publication of all its material resources. That will draw capital and satisfy investors, and will also inform and protect the individual citizens as to the nature and value of their own possessions. As matters now are, all investigations are made by rich companies and syndicates, that work in their own interest, and hold their findings in secret, until in many cases the unsuspecting owners of valuable properties, in ignorance of their rights, are induced to part with the same for very inadequate considerations.

As before stated, the Robert Clark Company, of Cincinnati, has on deposit, for sale, State and county publications, of the State Geological Survey, of the invoice value of nearly \$5,000. These are exposed to loss at any time for want of insurance. No funds have been provided for that purpose. \$2,540 of the said values consist in 127 copies of "Kentucky Fossil Corals, of the Silurian and Devonian Rocks of Kentucky, by William J. Davis," valued at \$20



per copy. The price is almost prohibitory, as but one copy has been sold for about four years past. At this rate, only 25 copies can be sold in a century and the number on hand, including about 80 copies in the collections here, will supply the demand for them for over eight hundred years to come. Applications have been made for them, but upon learning the price, purchases were not made. Of what value are such publications while locked up and stored away in this manner, and the world left in ignorance of their contents? I think a good way to utilize them would be to distribute copies among the public libraries of the State for preservation and reference, and that a nominal price of \$5 be placed on the remainder, for sale to persons calling for them.

A settlement was made with the Robert Clark Company, on September 2d, 1900, for all sales made by them for the previous year, according to a statement rendered by said company, and the receipts have been collected and turned over to the Auditor of Public Accounts. After this the company claimed that a mistake was made in making the remittance, and that they over-paid the amount, and the balance due them was left open to be adjusted by future sales.

### COMMERCIAL MINES.

On the first of January, 1901, there were in active operation in the State of Kentucky a total of 123 commercial coal mines, under the management of 91 companies, many of which are incorporated, being the same number of mines but a decrease of two companies, as compared to the previous year.

The following list contains the names of the several operators and of the counties where the said mines are located; also the character of opening, and the post office of each mine. In a number of cases, where the operators maintain a different office, in which the business of the company is transacted, that fact is noted and the location of such office is given, under the general head of "Notes on the Mines," in connection with the comments therein made on the said mines.

The list embraces the W. G. Duncan Coal Co., of Greenville, and R. S. Crawford & Co., of Greenwood, in the belief that the mines they represent will soon be in active operation.

Name of Operator.	Post Office.	County.	No. of Mines.	Character.
Pineville Coal Co . . . . .	Pineville . . .	Bell . . . . .	2	Drifts
National Coal & Iron Co. . . . .	Strait Creek . .	" . . . . .	1	"
Bennett's Fork Coal Co . . . . .	Middlesboro . .	" . . . . .	1	"
Excelsior Coal Mining Co . . . . .	Excelsior . . .	" . . . . .	1	"
The Tuckehoe Coal Co. . . . .	Four Mile . . .	" . . . . .	1	"
Ashland Coal & Iron Co. . . . .	Rush . . . . .	Boyd . . . . .	1	"
John Wurts, Lessee &c . . . . .	Ashland . . . .	" . . . . .	1	"
E. W. Strack . . . . .	" . . . . .	" . . . . .	1	"
R. T. Davis . . . . .	Jackson . . . .	Breathitt . . .	1	"
Aberdeen Coal & Mining Co . . . . .	Morgantown . .	Butler . . . . .	1	"
West Aberdeen Coal Co . . . . .	" . . . . .	" . . . . .	1	"
Eastern Kentucky Railway Co . . . .	Willard . . . .	Carter . . . . .	1	"

## COMMERCIAL MINES—Continued.

Name of Operator.	Post Office.	County.	No. of Mines.	Char- acter.
Ashland Coal & Iron Co . . . . .	Rush . . . . .	Carter . . . .	1	Drifts
Strait Creek Coal Co . . . . .	Denton . . . . .	" . . . . .	1	"
Kentucky Cannel Co . . . . .	Grayson . . . .	" . . . . .	1	"
Adkins Coal Co . . . . .	Rush . . . . .	" . . . . .	1	"
Empire Coal & Mining Co . . . . .	Empire . . . . .	Christian . . .	1	Shaft
New Holland Coal Co . . . . .	Owensboro . . . .	Davies . . . .	1	Slope
M. H. Enright . . . . .	Adair . . . . .	Hancock . . . .	1	Drift
Pittsburgh Coal Co . . . . .	Basket . . . . .	Henderson . . .	1	Shaft
Green River Coal & Mining Co . . . . .	Spottsville . . . .	" . . . . .	1	"
Corydon Coal Co . . . . .	Corydon . . . . .	" . . . . .	1	"
Henderson Mining & Manufact'g Co . . . . .	Henderson . . . .	" . . . . .	1	"
Peoples Mining Co . . . . .	" . . . . .	" . . . . .	1	"
Booth & Glover . . . . .	Hamby Station . .	Hopkins . . . .	1	Drift
Crabtree Coal Mining Co . . . . .	Ilseley . . . . .	" . . . . .	1	"
Oak Hill Coal Co . . . . .	Nortonville . . . .	" . . . . .	1	"
St. Bernard Coal Co . . . . .	Earlington . . . .	" . . . . .	3	"
St. Bernard Coal Co . . . . .	" . . . . .	" . . . . .	1	Slope
St. Bernard Coal Co . . . . .	Mortons Gap . . . .	" . . . . .	1	Drift
St. Bernard Coal Co . . . . .	Barnsley . . . . .	" . . . . .	1	"
St. Bernard Coal Co . . . . .	St. Charles . . . .	" . . . . .	2	"
Reinecke Coal Co . . . . .	Madisonville . . . .	" . . . . .	1	Shaft
Monarch Mining Co . . . . .	" . . . . .	" . . . . .	1	"
White House Cannel Coal Co . . . . .	Myrtle . . . . .	Johnson . . . .	2	Drifts
Greasy Creek Cannel Coal Co . . . . .	Eliza . . . . .	" . . . . .	1	"
North Jellico Coal Co . . . . .	Bertha . . . . .	Knox . . . . .	2	"
North Point Jellico Coal Co . . . . .	Gray . . . . .	" . . . . .	1	"

## COMMERCIAL MINES—Continued.

Name of Operator.	Post Office.	County.	No. of Mines.	Char- acter.
Burns Jellico Coal Co . . . . .	Gray . . . . .	Knox . . . . .	1	Drifts
Artemus Coal Co . . . . .	Artemus . . . . .	" . . . . .	1	"
East Jellico Coal Co . . . . .	Coalport . . . . .	" . . . . .	1	"
Knox Jem Coal Co . . . . .	Barboursville . . . . .	" . . . . .	1	"
Pittsburg Coal Co . . . . .	Pittsburgh . . . . .	Laurel . . . . .	2	"
Laurel Coal Co . . . . .	" . . . . .	" . . . . .	2	"
Pitman Coal Co . . . . .	" . . . . .	" . . . . .	1	"
Victoria Coal Co . . . . .	" . . . . .	" . . . . .	2	"
Almy, Wilkes & Thompson . . . . .	" . . . . .	" . . . . .	1	"
Standard Coal Co . . . . .	Viva . . . . .	" . . . . .	1	"
Bastin & Pritchard . . . . .	East Bernstadt . . . . .	" . . . . .	1	"
Manchester Coal Co . . . . .	" " . . . . .	" . . . . .	1	"
New Diamond Coal Co . . . . .	Altamont . . . . .	" . . . . .	1	"
Karl F. Bierach & Bro. Co . . . . .	Lily . . . . .	" . . . . .	1	"
Peach Orchard Coal Co . . . . .	Peach Orchard . . . . .	Lawrence . . . . .	2	"
J. H. Northup . . . . .	Walbridge . . . . .	" . . . . .	1	"
McGuire Coal Co . . . . .	Beattyville . . . . .	Lee . . . . .	1	"
L. C. Norman & Sons . . . . .	" . . . . .	" . . . . .	1	"
Field Coal Co . . . . .	Island . . . . .	McLean . . . . .	1	Slope
Island Coal Co . . . . .	" . . . . .	" . . . . .	1	Shaft
Central Coal & Iron Co . . . . .	Central City . . . . .	Muhlenberg . . . . .	1	"
Central Coal & Iron Co . . . . .	Powderly . . . . .	" . . . . .	1	"
Hillside Coal Co . . . . .	Mercer Station . . . . .	" . . . . .	1	"
Oakland Coal Co . . . . .	" " . . . . .	" . . . . .	1	"
Crescent Coal Co . . . . .	Bevier . . . . .	" . . . . .	1	"
Bevier Coal Co . . . . .	" . . . . .	" . . . . .	1	"



## COMMERCIAL MINES—Continued.

Name of Operator.	Post Office.	County.	No. of Mines.	Char- acter.
The Black Diamond Coal & Mining Co.	Drakesboro . .	Muhlenberg .	1	Shaft
Mud River Coal, Coke & Iron Co. . .	Mud River. . .	"	1	Slope
W. G. Duncan Coal Co. . . . .	Luzerne . . . .	"	1	Drift
Taylor Coal Co. . . . .	Taylor Mines .	Ohio . . . .	1	Slope
Williams Coal Co. . . . .	McHenry . . .	" . . . .	1	"
McHenry Coal Co. . . . .	" . . . .	" . . . .	1	"
McHenry Coal Co. . . . .	Echols . . . .	" . . . .	1	Shaft
Central Coal & Iron Co. . . . .	Render . . . .	" . . . .	1	Drift
Fordsville Block Coal Co. . . . .	Fordsville . . .	" . . . .	1	"
Jamestown Coal Co. . . . .	Pt. Pleasant . .	" . . . .	1	"
Deanfield Coal Co. . . . .	Aetnaville . . .	" . . . .	1	Shaft
Deanfield Coal Co. . . . .	" . . . .	" . . . .	1	Slope
J. C. Parker . . . . .	Parkers Lake .	Pulaski . . .	2	Drifts
Paris Coal Co. . . . .	" " . . .	" . . . .	1	"
Eagle Coal Co. . . . .	Barren Fork . .	" . . . .	1	"
Alpine Coal Co. . . . .	Alpine . . . .	" . . . .	1	"
Cogar Creek Coal Co. . . . .	Flat Rock . . .	" . . . .	1	"
Cumberland Coal Co. . . . .	" " . . . .	" . . . .	1	"
R. S. Crawford & Co. . . . .	Greenwood . . .	" . . . .	1	"
Ohio Valley Coal & Mining Co. . . .	DeKoven . . . .	Union . . . .	1	Slope
Paducah Coal & Mining Co. . . . .	Sturgis . . . .	" . . . .	1	"
Tradewater Coal Co. . . . .	" . . . .	" . . . .	1	Shaft
Ben C. Davidson . . . . .	Uniontown . . .	" . . . .	1	"
American Coal & Iron Co. . . . .	" . . . .	" . . . .	1	"
Providence Coal Co. . . . .	Providence . . .	Webster . . .	1	"
Providence Coal Co. . . . .	" . . . .	" . . . .	1	Slope

## COMMERCIAL MINES—Continued.

Name of Operator.	Post Office.	County.	No. of Mines.	Character.
Sebree Coal Co . . . . .	Sebree . . . . .	Webster . . .	1	Shaft
Wheatcroft Coal & Mining Co . . . . .	Wheatcroft . . .	" . . .	1	Drift
Whitley Coal Co . . . . .	Halsey . . . . .	Whitley . . .	3	"
East Tennessee Coal Co . . . . .	Jellico, Tenn. . .	" . . .	2	"
Pine Knot Coal Co . . . . .	Strunk . . . . .	" . . .	1	"
Mt. Morgan Coal Co . . . . .	Williamsburg . . .	" . . .	1	"
Main Jellico Mountain Coal Co . . . . .	Kensee . . . . .	" . . .	1	"
Jellico Mining Co . . . . .	Mt. Ash . . . . .	" . . .	2	"
Procter Coal Co . . . . .	Red Ash . . . . .	" . . .	6	"
Bryant Bros . . . . .	Pine Knot. . . . .	" . . .	4	"

Several companies have made new openings in connection with their mines, and in some cases have provided separate ventilation, as in case of extending an entry through one hill to daylight, and on into a second or third hill, as has been done at St. Charles, but all such are not designated as new mines, but are rightfully regarded as mere extensions of the old mine.

### SHAFT MINES.

The following list contains the names, location and depth of the several shaft mines of the State:

Name	County	Depth
Empire . . . . .	Christian . . . . .	54 feet
Rankin . . . . .	Henderson . . . . .	50 "
Henderson . . . . .	" . . . . .	180 "
Peoples . . . . .	" . . . . .	185 "
Corydon . . . . .	" . . . . .	185 "
Basket . . . . .	" . . . . .	185 "
Monarch . . . . .	Hopkins . . . . .	265 "
Reinecke . . . . .	" . . . . .	800 "
Island . . . . .	McLean . . . . .	75 "
Central . . . . .	Muhlenberg . . . . .	200 "
Memphis . . . . .	" . . . . .	40 "
Pierce . . . . .	" . . . . .	132 "
Hillside . . . . .	" . . . . .	60 "
Oakland . . . . .	" . . . . .	70 "
Powderly . . . . .	" . . . . .	60 "
Bevier . . . . .	" . . . . .	68 "
Echols . . . . .	Ohio . . . . .	65 "
Dean . . . . .	" . . . . .	75 "
Tradewater . . . . .	Union . . . . .	185 "
Davidson . . . . .	" . . . . .	200 "
American . . . . .	" . . . . .	185 "
Sebree . . . . .	Webster . . . . .	175 "
Providence . . . . .	" . . . . .	80 "

The T. L. Taylor mine, at Providence, mentioned in the 1899 report of this office, has been idle for more than a year past, and its name has been stricken from the list of producing mines.

The Wheatercroft Coal & Iron Co. contemplate, in the near future, opening a shaft mine on their property at Wheatercroft, Webster county.

### ABANDONED MINES.

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Several mines that contributed to the output of 1899, and some to the output of 1900, have been abandoned for various reasons. Some were exhausted, and others became unprofitable for operation. The list of such mines are now given, the counties where located being taken in alphabetical order.

#### BREATHITT COUNTY.

The old mine at Jackson, operated by Dudley, Shelby & Co., was abandoned during the summer, and a new drift was opened across the hollow to the west.

#### CARTER COUNTY.

Grant mine, known as No. 7, of the Ashland Coal & Iron Co., heretofore one of the most productive mines in Northeastern Kentucky, was entirely exhausted and abandoned on the 13th of July, 1900. Its production for several years past has been as follows:

1896 . . . . .	47,338 tons.
1897 . . . . .	44,366 tons.
1898 . . . . .	50,809 tons.
1899 . . . . .	83,117 tons.
1900 . . . . .	31,544 tons.

The average working force of 132½ men employed during 1899 was reduced to 70 men during 1900.



**STAR FURNACE MINE.**

The above named mine, that had been operated for some time by the Star Furnace Coal Co., was abandoned, as exhausted, about the close of 1899, and produced no coal during 1900.

**DAVIESS COUNTY.**

The old mine that had been operated a number of years by the New Holland Coal Co. was abandoned during the year, and a new mine was opened a short distance from the old one.

**KNOX COUNTY.**

The West Jellico Mine, that was opened by B. F. Gray, in 1894, and afterwards operated by him, and since his death by Mrs. Sarah M. Gray, under the name of the North Point Jellico Coal Co., was exhausted and abandoned on August 10, 1900. Its production in 1899 was 16,530 tons, and in 1900 was 12,606 tons.

**LAUREL COUNTY.**

The mine of the East Altamont Coal Co. was abandoned about the close of 1899, and produced no coal during 1900. The change in the track of the Altamont & Manchester railroad, on which it was located, left the mine without transportation, and since then no attempt has been made to operate it.

**MANCHESTER MINE.**

The new mine of the Manchester Coal Co., located on the left of the railroad as it goes east, was abandoned during 1900, and a new drift was opened near by on the right of the railroad.

**OLD STANDARD.**

The above named mine was idle much of 1899, and during nearly all of 1900, and may or may not be worked again. There has been no report from the mine since June last, when a production of 350 tons was made.

## REOPENED MINES.

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### BEAVER MINES.

R. S. Crawford & Co., postoffice, Greenwood, during the year did a great amount of work towards repairing and reopening the above-named mine, that has been idle and unproductive for several years past, but up to the close of the year no coal had been produced, nor does it appear when active operations will begin.

The character and extent of the repairs and equipments and the capacity of the mine under the new management will be more fully noted in the make up of the report of this office for the year 1901. The revival of such a vast enterprise will no doubt be of great interest and value to that community.

### DEAN MINE.

The above named mine, located at Halsey, and which has been idle for some years, was reopened during the year by the Whitley Coal Co., and is being operated in connection with the other mines of the company at that place.

## NEW MINES.

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A number of new coal mines, of the commercial class, were opened during the year. They are located in different sections of the State, and vary in capacity and extent of development, as well as in the character and value of their equipments and probable duration. A list and brief description of each are now given, taking the counties in alphabetical order.

### BELL COUNTY.

The Tuckehoe Coal Co. opened a new mine, on the line of the L. & N. railroad, at Four Mile. The mine is entered by a slope, with a 23 degree pitch and 170 feet long, and it is located in a seam that lies 120 feet below the one previously worked. The seam, as developed, is from 24 to 27 inches thick, but different test holes give from 34 to 38 inches. The product will be marketed as the "Tuckehoe Coal."

The coal contains neither sulphur, slate nor bone, and is, in fact, quite free from all impurities, as is shown by the following analysis:

Volatile combustible matters . . . . .	41.0	per cent.
Fixed carbon . . . . .	54.3	"
Ash . . . . .	4.7	"
Moisture, trace . . . . .		
Sulphur, trace . . . . .		
Total . . . . .	100.	per cent.

The mine is to be equipped with an electric mining and haulage plant, of the Link Belt type, and which is to be installed by the Goodman Manufacturing Co., of Chicago, Ill. A 200 H. P. engine will be used to run a 100 K. W. Link Belt generator, which



is to operate two mining machines, and have enough reserve power for mine haulage, and to run additional machines as they may be needed.

The coal will be hoisted by a 40 H. P. steam engine. The mine will be worked on the "Long Wall" system. Two machines, one a Breast Chain and the other a "Long Wall," have already been installed, and others are to be added when made necessary by the progress of the work.

#### **BREATHITT COUNTY.**

During the summer months, Dudley, Shelby & Co. opened a new drift, at Jackson, which lies just across the hollow west of the old mine. About October 1st, they sold their interest in the mine to "The Kentucky Union Co.," that leased it to R. T. Davis, who has been operating it until the present time. The mine has been equipped with revolving screens, and a new furnace has been built. It is estimated to run fifteen years. During December, fifty men were employed and 1,750 tons of coal were produced.

#### **DAVIESS COUNTY.**

The New Holland Coal Co. abandoned its old mine, but opened a new one, which is located but a short distance from the old one. The vein worked is No. 9, and is  $4\frac{1}{2}$  feet thick. The mine has been equipped with a new pumping plant, and a new hoisting engine and boiler, at a cost of \$2,000. The company estimates a run of 25 years.

#### **JOHNSON COUNTY.**

Conspicuous among the new mines of the year is the one recently opened by the White House Cannel Coal Co., in a 11-foot bituminous coal vein on White House creek. This vein is by far the thickest of any that has ever been developed in this State, and the progress of the work will be watched with unusual interest.



The vein is 14 feet thick, but it contains several partings of clay and slate. The position, character and thickness of the several partings are as follows: The bottom coal seam is 8 inches thick. This is overlaid with 18 inches of clay. Then comes in regular order, coal, 12 inches; clay 2 inches; coal, 22 inches; slate, 6 inches; coal, 44 inches; slate, 6 inches; coal, 6 inches, slate, 6 inches, and top coal, 38 inches. The roof is first a shaly sandstone, over which lies a massive sandstone.

This vein is described as "12-foot coal," by Prof. C. Newton Brown, an eminent geologist and engineer, of the Ohio State University, in a report made by him in January, 1900, to the Chief Engineer of the War Department at Washington, D. C., of the work done by him towards ascertaining the mineral wealth of the Big Sandy valley.

The survey was made carrying out a recent act of Congress appropriating money for the improvement of the Big Sandy river.

The report, on account of the high standing of its author, and the character of the work on which it is based, is highly authentic, and is quite a valuable contribution to the geological literature of the State. It was issued by the House of Representatives, of the Fifty-sixth Congress, 1st session, in the form of "Document No. 326," a portion of which will be found in another part of this report under the head of, "The Big Sandy Valley."

In a communication to this office from Col. Jay H. Northup, general superintendent of the mine, of date, December 6, 1900, I was informed that the mine was opened sufficiently to produce 250 tons of coal per day, and that it would be in full operation by January of the present year. In order to get shipment for the coal, a branch railroad nearly two miles long has been built connecting the tippie with the White House branch of the Chesapeake & Ohio railroad. The mine, as at present developed, rests on the 18 inches of clay named above, and everything is taken out until the 38 inch coal at the top is reached. This makes a solid excavation of 8 2-3 feet, of which 7 feet are coal and 1 2-3 feet are clay and slate. After completing the mine on this plan, it is the

intention of the managers to let down the top vein, commencing at the extreme head workings, and drawing back towards the mouth of the mine. This plan is deemed to be the most practical, and is, in fact, much the safest, and the most economical one that can be adopted, because of the great difficulty and cost, and the dangers attending an attempt to hold the roof, if all the excavations should be made at one time.

The mine will have furnace ventilation. Up to January 1st, about 4,000 tons of coal had been mined and stocked along the line of the tramway waiting the completion of the same. The coal is said to be of superior quality. It is hard and firm and burns into a very clean, white ash, and it leaves but little, if any, clinker, which indicates the entire absence of sulphur.

#### KNOX COUNTY.

One of the most prominent new mines of the year is the "Knox Gem," at Barboursville, owned and operated by the Knox Gem Coal Co., W. G. Freeman, president; B. Moore, secretary and treasurer and B. R. Hutchcraft, general manager. The company was incorporated April 23, 1900, and active work towards the development of the mine was commenced about April 26th. Sufficient entry work had been driven by the middle of December to employ 70 miners.

The mine is a drift, and is located in what is known as the "Knox Gem" vein, which is from 26 to 30 inches thick. It has furnace ventilation,

No analysis of the coal has been made, but it is represented to be much like the Birdseye cannel at the Halsey mine. It is said to be much harder than the Jellico and Laurel county coals, and it mines easily in large blocks. In burning it makes a bright, long flame and leaves no clinker and as little ashes as wood. The coal contains no sulphur or other impurity and has no partings nor sandbands.

The entire plant, in construction and equipments, up to December 10, 1900, though still unfinished, had cost the sum of \$20,000.



A further mention of the enterprise will be found under the head of "Mine Improvements."

#### **GRAY'S MINE.**

During the fall months another mine was opened on the line of the L. & N. railroad, about one and one-half miles east of the town of Gray, by Mrs. Sarah M. Gray, who is operating under the name of "The North Point Jellico Coal Co." About 30 miners are employed, and 1,948 tons of coal were produced by the end of the year. The vein worked is about 4 feet thick, and contains, in the middle, a layer of cannel coal 8 or 9 inches thick. It is expected during the present year to reach a daily output of 200 tons.

The mine is connected with the railroad by a tramroad about one mile long, and an incline 525 feet long. At the close of the year, the mine entry had been driven about 150 feet, and the cross entries about 300 feet. The old mine, heretofore worked by this company and known as the West Jellico or North Point, has been abandoned.

#### **LAUREL COUNTY.**

The Manchester Coal Co. opened a new drift on the right of the railroad, near the former workings, which are now abandoned.

#### **LAWRENCE COUNTY.**

The Peach Orchard Coal Co. opened a new mine in the same hill as the Annie mine and some distance south of it, and at the close of the year were employing about 25 men in its operation. About 800 feet of main entry had been driven and some cross entries had been turned. The tipple is at the foot of an incline, in a hollow about one hundred feet below the mouth of the mine. The opening of the mine and its equipment with tipple, switches and incline, cost about \$5,000.

**MORGAN COUNTY.**

The present year will add Morgan to the list of coal producing counties and enlarge the work of this office so as to embrace that territory.

Though known to be specially rich in cannel coal and timber, no effort has heretofore been made to utilize them, because, having no transportation, that section has been shut out from the markets of the country, and its vast mineral wealth has remained almost entirely undeveloped. But this difficulty will shortly be overcome by the building of that section of the Ohio and Kentucky railroad that lies between Jackson in Breathitt county and Caney in Morgan county, a distance of about 27 miles. The road connects with the Lexington & Eastern, at a point about one mile below Jackson, and will be operated in connection with the latter road. The road would have been completed and fully equipped for operation by the early spring of the present year, but for the washing away of the river span of the railroad bridge that crosses the north fork of Kentucky river by the high waters of December last year. This accident caused heavy loss and great delay in the completion of the enterprise. A contract for the building of a new bridge has been awarded, but it will probably be September 1st before it will be finished.

**MUHLENBERG COUNTY.**

The W. G. Duncan Coal Co., of which W. G. Duncan is president, has opened a new mine on the Illinois Central railroad, at Luzerne, in No. 9 coal vein. None of the particulars have been received, except that the mine will be very extensive and well equipped and that the first shipment of coal was expected to be made about March 1st of the present year. An extended report of this mine will be given in the next annual report of this office.



**PULASKI COUNTY.**

A new mine was opened near Parker's Lake by the Paris Coal Co., a co-operative company composed of nine persons. H. P. Souleyret is general manager and superintendent and M. E. Quenon, secretary and treasurer. The vein worked is 25 inches thick, and there is a mining area of 40 acres in connection with the mine. The first shipment of coal was made in August.

**FLAT ROCK.**

A new mine was also opened at Flat Rock by the Cumberland Coal Co.; R. A. Williams, general manager. The vein worked is 34 inches thick, and the company estimates a five years' run before exhausting the mine. The first output was made in November, when an average of 40 men were employed and 653 tons were produced.

**UNION COUNTY.**

Early in the year a new mine was opened by the Illinois Power Co., in No. 11 coal vein, near Uniontown. On June 1, 1900, the property passed into the hands of the American Coal & Iron Co.; A. W. Voegtly, president and R. A. Brashear, secretary and treasurer.

The mine is a shaft 185 feet deep, and is ventilated by a fan which is run as a down-cast. The company reports no production of coal; however, it did supply a small wagon trade. The vein is five feet thick, and the company has an area of 1,500 acres. An average force of 12 men in June, which increased to 40 men in December, were employed, principally in opening up the mine preparatory to a general run of coal, which is expected to be made during 1901. The top is solid limestone which dispenses entirely with need of props.

**WEBSTER COUNTY.**

A new mine was opened at Wheatcroft, a new town on the Kentucky Western railway, by the Wheatcroft Coal & Mining Co. The mine is a drift and has been run for a number of years as a small country bank, and the coal has been hauled in all directions for a radius of many miles, on account of its superior quality for blacksmithing and domestic purposes. The vein worked is No. 11, and is about 6 feet thick, and is known throughout the section as the "Rock Spring" or "Cullen" coal. The company reports that it has had a sample car of the coal coked in Chicago with excellent results, and it anticipates the establishment of an extensive coking plant at an early date.

The Kentucky Western railway extends from Dixon, the county seat of Webster county, to Blackford where connection is made with the Ohio Valley division of the Illinois Central railroad. The intermediate stations are Wheatcroft, Clay, Lisman and West Vandersberg. The building of this road will most likely cause the development of a number of new mines, as it passes through a rich coal territory.

The first mining at Wheatcroft by the new company was done in September, when an average of 12 men were employed for 18 days, and 901 tons of coal were produced. The entire production of the year was 3,772 tons.



## GENERAL STATISTICS.

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### OUTPUT.

(In tons of 2,000 pounds.)

The coal production of all the commercial mines of the State for the year 1900, is much the largest in its history, reaching 5,020,675 tons as compared to 4,505,439 tons produced during 1899. A few of the counties, because of strikes or other local hindrances, sustained small losses, or show but slight gains, but as a whole every section of the State contributed to the material increase of the year, and advance reports from various counties indicate still greater prosperity in the future.

The significance of this gain of 515,236 tons is made more prominent when in connection with it, we consider the further facts that the production of 1897 was 120,574 tons greater than that of 1896, and that the production of 1898 was 238,078 tons greater than that of 1897, and that the production of 1899 was 963,306 tons greater than that of 1898. The tonnage of 1896 was only 3,183,497 tons. This is 1,837,196 tons less than that of 1900, and represents a gain of 57.7 per cent in the four years of department work under the supervision of the present officials of this office. These constant and rapid gains must be gratifying to an interested public as well as to all branches of the mining industry, and are especially so to the incumbents of this office, who feel themselves entitled to some share of the praise for the wonderful advancements made, but they are content to submit the records of the department while under their jurisdiction to the impartial judgment of an honest constituency, and abide their verdict, and they accord to both operators and miners the full

honors due them for their part in bringing about the general success of the period mentioned.

The production of the year would have been perceptibly larger but for strikes and consequent suspensions in several counties of the Western and Southeastern districts, as is detailed in another chapter of this report.

It is well to note that the increase of the year did not come from an increased number of producing mines, nor from any material increase in the number of employes engaged, but mainly from better and enlarged mining facilities, and more constant work than in former years. All in all, it is good to know that this, the greatest industry of the State, is permanently established, and is yearly increasing in value, and more and more stimulating every trade interest of the State, and adding its thousands of blessings to the home life of its people.

Then the capacity of these mines should not be measured from the present output, as they are capable of still greater development and output, as such would be the natural result of working fuller time and larger force, and of the extension to other mines of improved methods for mining, and of their increase in mines where now established. Then as we consider the extent and possibilities of the great coal fields lying in our Western district, and along our eastern and southeastern borders, yet untouched and shut off from the markets of the country, mainly from lack of transportation facilities, we become amazed and lost in immensity of thought as we try to compass their magnitude, and we wonder what the results shall be when all these vast treasures are uncovered and emptied into the many avenues of commerce. And here I pause to say, that it may be well after all that so many of these mountains and valleys have not been robbed of their rich deposits, but are left to give employment and subsistence to the generations that are to come after us, as the greed of the present generation would absorb the whole earth if obtainable and possible.

But the time has no doubt come when coal, nature's own prod-



uct, so widely distributed over the earth in such immense quantities, and so indispensable to the welfare of man, should take its rightful place among the controlling factors of the business world, and be given the head place. A half century ago, eminent writers said, "Cotton is King," and so it was, but that was an age when the great sciences and mechanical arts, that now astonish the world with their wonderful achievements, were in their infancy, and now with one loud acclaim the business world says, "Coal is King," and so it is. It has become the potent prop of the manufacturing and commercial world, and it reaches throughout the domains of all domestic life. In the mechanical world it has become the principal source of light, heat and power. It lights our homes and places of business, and the streets of our great cities, and every place where the avocations of man take him. It has become the fuel supply of the hearthstone, cookery, mill, forge, factory, furnace, workshop and office, and of almost every other trade enterprise of millions in all nations of the earth, and a sudden stop in its production would paralyze the wheels of commerce in all lands, and on the highways of travel, and commerce on the seas, and quickly engulf its untold numbers of dependents in want and suffering.

If we contemplate the effect of a general coal famine; the stopping of every railroad engine, mill and factory in the land, and the tying up of every ship and trade craft that speed across the waters, and every other misfortune that would follow in its wake, we become appalled at the awful picture. We trust that such a catastrophe may never befall our people. Yes, "Coal is King," and the people of every trade and calling have a common interest in having it in bountiful supply, and at a price within reach of all classes.

We now give the per cent. of increase in production over 1899, in all counties producing over 100,000 tons:

County	Per Cent. Gain	County	Per Cent. Gain
Bell . . . . .	54.4	Knox . . . . .	27.7
Boyd . . . . .	3.9	Laurel . . . . .	14.8
Carter . . . . .	30.0	Ohio . . . . .	3.8
Henderson . . . . .	2.6	Union . . . . .	42.5
Hopkins . . . . .	6.9	Whitley . . . . .	11.0

Knox county, that in 1899 sustained a loss of 14.4 per cent. as compared to its 1898 output, has made a reasonable gain over 1898, and taken its place in the column of prosperous counties.

Muhlenberg county, that in 1899 made the enormous gain of 54.5 per cent. over its 1898 output, sustained a loss, as compared to its 1899 output, of 5,265 tons, or 1.27 per cent. This loss was occasioned by either one of two main causes. First; the strike and consequent suspension of mining for the most of the month of April, as is detailed in another chapter of this report, reduced the county's output to only 4,297 tons, whereas 50,757 tons were produced during the preceding month (March.) Second. On account of a squeeze, or general fall of top, so as to shut off all workings on the east side of Central mine from May until December, 1899, the product of this mine alone was cut short probably 50,000 tons, so that in the absence of either cause the county would have shown a reasonable gain, and in the absence of both causes it would have shown a handsome gain indeed. If advance reports from the mines in this county, for the present year, 1901, could be taken as an index of what the entire year shall be, then the product of 1901 will be much the largest ever made in the county.

Ohio county suffered as much from the strike as Muhlenberg, and but for which the county would doubtless have shown as good a per cent. of gain as Hopkins county.

The heavy gain in Union county is attributable mainly to the increase of the mine at DeKoven, that raised its output of 11,716



tons in 1899 to 71,368 tons in 1900. This mine was idle most of 1899 on account of a disagreement as to the wage scale.

Pulaski and Webster counties each produced over 100,000 tons during the year, the former showing a slight gain, and the latter a slight loss.

The gain of 6.9 per cent. in Hopkins county represents 88,033 tons, and is a much better showing than the figures indicate, from the fact that work in that county has been steady and the output normal for several years past, and that the output of 1899 was an extraordinary gain of 31.6 per cent., or 303,991 tons in excess that of 1898. Considering all the environments the county did well to maintain in 1900 the tonnage reached in 1899, and in outstripping it so far it proves that it is a very giant within itself and able to hold its rightful place as the leading coal producer in the Commonwealth. If the ratio of increase reported for January shall be continued throughout the year, its output for 1901 will be a marked increase over the year just closed.

In the following tables of output, comparisons are made with that of 1899:

#### PRODUCTIONS BY DISTRICTS.

DISTRICT	Tons, 1899	Tons, 1900	Tons, Gain	Per Cent. Gain
Western . . . . .	2,740,564.72	2,933,398.14	192,833.42	7.04
Southeastern . . . . .	1,355,878.24	1,604,531.97	248,653.73	18.30
Northeastern . . . . .	408,995.98	482,745.00	73,749.02	18.10
Totals . . . . .	4,505,438.94	5,020,675.11	515,236.17	

The per cent. of gain in 1899 over 1898, was:

Western District . . . . .	32.2 per cent.
Southeastern District . . . . .	20.6 per cent.
Northeastern . . . . .	16.6 per cent.

## PRODUCTION BY COUNTIES.

COUNTY	Tons, 1899	Tons, 1900	Gain	Loss
Bell . . . . .	132,673.94	204,954	72,280	. . . . .
Beyd . . . . .	159,421.40	165,703	6,282	. . . . .
Breathitt . . . . .	15,699.64	16,416	716	. . . . .
Butler . . . . .	33,435.12	30,788	. . . . .	2,647
Cartor . . . . .	166,129.14	215,826	49,697	. . . . .
Christian . . . . .	65,699.10	82,663	16,964	. . . . .
Daviess . . . . .	8,617.00	10,872	2,255	. . . . .
Hancock . . . . .	8,158.96	5,869	. . . . .	2,290
Henderson . . . . .	124,404.80	127,705	3,330	. . . . .
Hopkins . . . . .	1,265,706.66	1,353,740	88,033	. . . . .
Johnson . . . . .	11,380.59	15,635	5,254	. . . . .
Knox . . . . .	244,090.56	311,698	67,607	. . . . .
Laurel . . . . .	314,994.13	361,639	46,635	. . . . .
Lawrence . . . . .	49,418.20	55,566	6,148	. . . . .
Lee . . . . .	6,947.01	13,604	6,657	. . . . .
McLean . . . . .	28,795.88	31,816	3,520	. . . . .
Muhlenberg . . . . .	414,846.34	409,581	. . . . .	5,265
Ohio . . . . .	515,867.00	535,700	19,833	. . . . .
Pulaski . . . . .	102,288.63	102,414	125	. . . . .
Union . . . . .	167,789.13	239,091	71,302	. . . . .
Webster . . . . .	107,244.73	106,177	. . . . .	1,068
Whitley . . . . .	561,831.08	623,729	61,898	. . . . .
Totals . . . . .	4,505,438.94	5,020,675	526,506	11,270

Net gain 1900, 515,236 tons.

In the above, as in the following tables, fractions of tons are discarded.

**PRODUCTION BY MONTHS.**

<b>MONTHS.</b>	<b>Western District.</b>	<b>Southeastern District.</b>	<b>Northeastern District.</b>	<b>Total Tons.</b>
January . . . . .	805,989	165,806	44,565	516,361
February . . . . .	268,785	133,855	42,107	444,247
March . . . . .	288,158	148,983	44,841	481,480
April . . . . .	150,106	130,590	36,712	317,407
May . . . . .	212,025	136,768	42,704	391,497
June . . . . .	212,789	116,347	36,927	366,064
July . . . . .	212,067	128,770	32,204	373,041
August . . . . .	228,752	149,092	37,951	410,795
September . . . . .	224,639	70,488	30,500	325,625
October . . . . .	285,092	134,720	43,615	463,426
November . . . . .	272,548	145,161	42,555	460,265
December . . . . .	277,548	144,402	48,564	470,517
<b>Totals . . . . .</b>	<b>2,983,398</b>	<b>1,604,432</b>	<b>482,745</b>	<b>5,020,675</b>

**PRODUCTION BY HALF YEARS.**

	<b>Tons, 1899.</b>	<b>Tons, 1900.</b>	<b>Gain.</b>
First half . . . . .	2,152,908	2,517,005	364,102
Second half . . . . .	2,352,536	2,503,670	151,134
<b>Totals . . . . .</b>	<b>4,505,489</b>	<b>5,020,675</b>	<b>515,236</b>



The following table shows the monthly production of the four leading counties, Hopkins, Whitley, Ohio and Muhlenberg:

MONTH.	Hopkins.	Whitley.	Ohio.	Muhlenberg.
January . . . . .	127,295	65,353	60,195	48,448
February . . . . .	111,576	51,629	53,798	43,930
March . . . . .	118,021	58,123	53,865	50,758
April . . . . .	107,185	49,748	10,531	4,298
May . . . . .	105,743	50,040	41,313	21,907
June . . . . .	104,576	47,254	43,968	20,277
July . . . . .	104,979	48,655	37,100	26,555
August . . . . .	98,495	55,922	45,667	35,022
September . . . . .	96,831	30,997	44,329	34,155
October . . . . .	133,074	57,859	52,356	39,105
November . . . . .	128,056	54,200	44,083	36,929
December . . . . .	117,909	53,949	48,535	48,197
Totals 1900 . . . . .	1,353,740	623,729	535,740	409,581
" 1899 . . . . .	1,265,706	561,831	515,867	414,846
" 1898 . . . . .	961,716	396,310	436,519	268,507
" 1897 . . . . .	961,412	197,728	460,693	261,783
" 1896 . . . . .	777,182	428,981	368,094	256,268

#### PER CENT OF GAIN SINCE 1896.

Hopkins . . . . .	74.32 per cent.
Whitley . . . . .	45.40 "
Ohio . . . . .	45.54 "
Muhlenberg . . . . .	60.00 "

**ORDER OF PRODUCTION.**

The counties producing over 100,000 tons each, for 1899, and 1900, in point are in the following order for the two years named:

1899.	1900.	1899.	1900.
1. Hopkins.	1. Hopkins.	8. Carter.	8. Carter.
2. Whitley.	2. Whitley.	9. Boyd.	9. Bell.
3. Ohio.	3. Ohio.	10. Bell.	10. Boyd.
4. Muhlenberg.	4. Muhlenberg.	11. Henderson.	11. Henderson.
5. Laurel.	5. Laurel.	12. Webster.	12. Webster.
6. Knox.	6. Knox.	13. Pulaski.	13. Pulaski.
7. Union.	7. Union.		

It will be noticed that the only change in the two years is in Bell and Boyd counties, the former advancing one point, and the latter falling back one point.

**PRODUCTION BY YEARS.**

The following table shows the tonnage of bituminous and cannel coal, and the total production each year since January 1, 1888:

YEAR.	Bituminous.	Cannel.	TOTAL.
1888 . . . . .	2,342,058	42,835	2,384,893
1889 . . . . .	2,205,434	40,285	2,246,259
1890 . . . . .	2,483,144	49,382	2,532,526
1891 . . . . .	2,907,096	43,040	2,950,136
1892 . . . . .	2,973,455	53,842	3,027,297
1893 . . . . .	3,258,712	43,538	3,302,250
1894 . . . . .	2,899,692	57,503	2,957,195
1895 . . . . .	3,138,023	69,747	3,207,770
1896 . . . . .	3,128,818	54,660	3,182,478
1897 . . . . .	3,247,542	56,511	3,304,053
1898 . . . . .	3,492,243	49,889	3,542,132
1899 . . . . .	4,469,100	36,339	4,505,439
1900 . . . . .	4,991,205	29,470	5,020,675

**PRODUCTION OF LEADING COMPANIES.**

The mining companies, whether operating one or more mines that produced over 100,000 tons during the year are given in the following table, in the order of their production, and wherever any company, though largely interested, is operating a mine in the name of a different company, then the report is credited to the latter company, as this office must follow the reports as made.

COMPANY.	Mines	County.	1899	1900
1. St. Bernard Coal Co. . . . .	8	Hopkins . . .	777,250	872,142
2. { Central Coal & Iron Co. . . . .	1	Ohio . . . }	251,122	250,355
{ Central Coal & Iron Co. . . . .	2	Muhlenberg }		
3. Reinecke Coal Co. . . . .	1	Hopkins . . .	179,005	235,105
4. North Jellico Coal Co. . . . .	2	Knox . . . .	202,340	217,987
5. { Ashland Coal and Iron Co. . . . .	1	Boyd . . . }	209,025	216,238
{ Ashland Coal & Iron Co. . . . .	2	Carter . . . }		
6. Procter Coal Co. . . . .	4	Whitley . . .	198,934	206,998
7. McHenry Coal Co. . . . .	2	Ohio . . . .	178,362	178,110
8. Taylor Coal Co. . . . .	1	Ohio . . . .	124,704	130,272
Totals . . . . .	24		2,120,742	2,307,207

Gain during 1900, 186,465 tons.



## PRODUCTION OF LEADING MINES.

The following table contains the name, location and output of all mines producing more than 50,000 tons, in the order of their production in 1900, counting all contiguous mines operated by the same company and using the same tipple, like the St. Charles, North Jellico and Procter mines as only one mine. The list has grown from 35 in 1899 to 43 in 1900:

MINE.	County.	1899.	1900.
Reinecke . . . . .	Hopkins . . .	107,905	235,105
North Jellico . . . . .	Knox . . . . .	202,340	217,987
Earlington, No. 9 . . . . .	Hopkins . . .	222,410	182,469
St. Charles . . . . .	"	141,276	148,323
Earlington No. 11 . . . . .	"	140,176	142,990
Taylor . . . . .	Ohio . . . . .	124,704	130,273
Diamond . . . . .	Hopkins . . .	169,355	129,465
Arnold . . . . .	"	55,557	125,867
Render . . . . .	Ohio . . . . .	102,737	111,231
Procter . . . . .	Whitley . . .	106,079	110,299
Rush No. 10 . . . . .	Carter . . . .	18,147	105,733
McHenry . . . . .	Ohio . . . . .	101,813	101,321
Grinstead . . . . .	Whitley . . .	92,855	96,699
National . . . . .	Bell . . . . .	40,764	95,606
Kensee . . . . .	Whitley . . .	86,792	94,787
Crabtree . . . . .	Hopkins . . .	76,794	91,020
Mt. Morgan . . . . .	Whitley . . .	50,582	89,964
Tradewater . . . . .	Union . . . . .	79,180	99,398
Central . . . . .	Muhlenberg .	130,805	86,261
Empire . . . . .	Christian . .	65,699	82,663
Monarch . . . . .	Hopkins . . .	64,269	79,309
Hecla . . . . .	"	62,088	79,101
Rush No. 6 . . . . .	Boyd . . . . .	107,861	78,961

## PRODUCTION OF LEADING MINES—Continued.

MINE.	County.	1899.	1900.
Mt. Ash . . . . .	Whitley . . .	71,822	77,509
Echols . . . . .	Ohio . . . .	76,549	76,789
Providence . . . . .	Webster . . .	67,030	76,416
Cumberland . . . . .	Union . . . .	70,247	72,392
DeKoven . . . . .	"	11,716	71,868
Pineville . . . . .	Bell . . . . .	47,546	70,915
Barren Fork . . . . .	Pulaski . . .	67,606	64,802
Barnaley . . . . .	Hopkins . . .	51,662	63,927
East Tenn . . . . .	Whitley . . .	61,188	63,154
John Wurts . . . . .	Boyd . . . .	50,050	62,349
Laurel . . . . .	Laurel . . .	46,166	61,362
Crescent . . . . .	Muhlenberg .	66,427	61,228
Williams . . . . .	Ohio . . . .	55,476	60,086
Pitman . . . . .	Laurel . . .	62,627	59,353
Basket . . . . .	Henderson . .	64,290	56,574
New Diamond . . . . .	Laurel . . .	20,877	55,517
Pesch Orchard . . . . .	Lawrence . .	46,846	54,539
Black Diamond . . . . .	Muhlenberg .	53,072	54,224
Powderly . . . . .	"	40,368	52,863
Bevier . . . . .	"	37,431	52,030

The noted changes in the order of the list are in the first and the third named in the list. Reinecke mine, the third in the 1899 list, has forced itself to the first place in 1900, and Earlington No. 9, the first in the list of 1899, has dropped back to third place in 1900. North Jellico mine maintains second place, the same as in 1899. There were material changes also in the output and order of other mines named on the list, as can be easily seen from an examination of the output of each year.



**PRODUCTION OF MINES ALONG THE SEVERAL RAILROAD LINES.**

I have not endeavored to learn the exact coal carrying trade of the different railroads of the State. I have deemed it of interest to the public, and sufficiently instructive to those most concerned, to give the total production of all the mines located on the lines, divisions and branches of the different systems. It is well known that a small per cent. of the product is consumed by the local trade, and another small per cent. of it is used at the mines, while the main bulk of it is taken by the different railroads to various markets, both in and out of the State.

Name of Division.	1899. Tons.	1900. Tons.
<b>Louisville &amp; Nashville R. R.</b>		
Henderson & Nashville Division . . . . .	1,086,094	1,235,932
Owensboro & Nashville Division . . . . .	329,154	298,260
Knoxville (K. C.) Division . . . . .	825,948	925,536
Cumberland Valley Division . . . . .	376,765	516,652
Providence Division . . . . .	67,030	76,416
Totals L. & N. System . . . . .	2,684,991	3,052,796
Total 1898, 1,914,781 tons . . . . .		
" 1897, 1,607,075 tons . . . . .		
<b>Illinois Central R. R.</b>		
Main Line . . . . .	922,100	991,630
Ohio Valley Division . . . . .	175,880	245,710
Owensboro Division . . . . .	49,926	56,000
Totals I. C. System . . . . .	911,364	1,293,340
Total 1898, 911,364 tons . . . . .		
" 1897, 805,037 tons . . . . .		
Louisville, Henderson & St. Louis . . . . .	114,540	81,160
Chesapeake & Ohio and connections . . . . .	386,348	452,727
Cincinnati, New Orleans & T. P. . . . .	153,066	162,242

**PRODUCTION OF CANNEL.**

The entire production of cannel coal for 1900 was 29,471 tons, a decrease as compared to 1899, of 7,168 tons. This is the least production of any one year which this office has a record, and it is attributable to a less number of active mines.

The Mary Hull mine, Bell county, has been idle all the year though it added 11,649 tons to the output of 1899. The mine at White House is also practically exhausted.

I think it probable that 1901 will show a material increase in this product, from the fact that districts in Morgan county will be entered by September, and another new mine be opened in Bell county.

The following table shows the tonnage of each county:

COUNTY	1899	1900	Gain	Loss
Bell . . . . .	16,038	5,666	. . . . .	10,372
Carter . . . . .	3,881	6,384	2,453	. . . . .
Johnson . . . . .	11,266	14,538	3,272	. . . . .
Whitley . . . . .	5,454	2,933	. . . . .	2,521
Totals . . . . .	36,639	29,471	5,725	12,898

Net loss, 7,168 tons.

The following table shows the output of each mine that contributed to the year's output, together with the name of the county where located, also the postoffice of each of the mines:

MINE	Post Office	County	Tons
Pineville . . . . .	Pineville . . . . .	Bell . . .	5,666
Boghead . . . . .	Grayson . . . . .	Carter . .	6,334
Whitehouse . . . . .	Louisa . . . . .	Johnson .	3,872
Greasy Creek . . . . .	Eliza . . . . .	Johnson .	10,666
Birdeye . . . . .	Halsey . . . . .	Whitley .	2,933
Total . . . . .			29,471

The name of the several companies operating the above mines can be found in the chapter on "Notes on the Mines" in connection with the comments on the said mines.

#### PRODUCTION OF COKE.

The coke production of the year is a marked increase over that of 1899, but the increase comes mainly from one plant in Bell county. Better prices have been realized than last year. The St. Bernard Coal Co. reports the price at \$1.926 per ton, whereas the 1899 product was sold for \$1.425.

The following table shows the tonnage of the several plants, and the names of the counties where located, and the names of the companies operating them:

COMPANY	Post Office	County	Tons, 1899	Tons, 1900
St. Bernard Coal Co . .	Earlington . . . .	Hopkins .	35,437	34,571
Ohio Valley C. & M. Co .	DeKoven . . . . .	Union . .	364	2,293
Pineville Coal Co . . . .	Pineville . . . . .	Bell . . .	5,400	3,984
National Coal & Iron Co.	Straight Creek . .	Bell . . .	14,379	32,127
Totals . . . . .			55,580	72,975

Gain over 1899, 17,395 tons.

**EMPLOYES.**

The greatest number of employes engaged in all departments of mine labor for the several months of the year, vary each month from 10,222 in December to 7,906 in April, and divided among the three districts as follows:

DISTRICTS	December	April
Western . . . . .	4,988	3,580
Southeastern . . . . .	4,113	3,398
Northeastern . . . . .	1,126	928
Totals 1900 . . . . .	10,222	7,906
Totals 1899 . . . . .	9,651	7,662
Totals 1898 . . . . .	8,408	6,828
Totals 1897 . . . . .	8,611	6,366

Reports from the various mines show that upon a general average about 85 per cent. of the employes worked underground at the different kinds of labor.

**EMPLOYES BY MONTHS.**

The following table shows a total each month of the greatest and the average number of coal mine employes of the entire State, and the tons of coal produced each month:

MONTH	Greatest	Average	Tons
January . . . . .	10,009	9,059	516,361
February . . . . .	9,395	8,443	444,247
March . . . . .	9,199	8,412	481,430
April . . . . .	7,906	7,810	317,407
May . . . . .	8,822	8,298	391,497
June . . . . .	8,935	8,191	368,064
July . . . . .	9,174	8,402	378,041
August . . . . .	9,136	8,452	410,795
September . . . . .	8,185	7,492	325,625
October . . . . .	9,291	8,392	468,426
November . . . . .	10,218	9,148	460,265
December . . . . .	10,222	9,247	470,517
Monthly average . . .	9,208	8,237	419,228
Monthly average, 1899 .	8,274	7,529	375,453
Monthly average, 1898 .	7,089	6,399	295,178
Monthly average, 1897 .	6,712	6,042	275,338



The following table shows the greatest and the average number of employes working in each county during the month of December, also the tonnage of each county for that month:

COUNTY	Greatest	Average	Tons
Bell . . . . .	956	787	22,358
Boyd . . . . .	270	211	15,887
Breathitt . . . . .	50	50	1,749
Butler . . . . .	121	105	2,860
Carter . . . . .	508	445	22,892
Christian . . . . .	107	95	5,446
Daviess . . . . .	82	81	1,824
Hancock . . . . .	80	28	747
Henderson . . . . .	828	802	15,670
Hopkins . . . . .	1,828	1,782	117,909
Johnson . . . . .	116	96	2,214
Knox . . . . .	548	490	26,511
Laurel . . . . .	912	808	30,741
Lawrence . . . . .	181	116	5,228
Lee . . . . .	54	42	644
McLean . . . . .	74	70	5,329
Muhlenberg . . . . .	952	864	48,197
Ohio . . . . .	1,028	940	48,585
Pulaski . . . . .	853	827	10,846
Union . . . . .	848	827	22,888
Webster . . . . .	142	112	8,192
Whitley . . . . .	1,844	1,229	53,949
Total . . . . .	10,222	9,252	470,516

The following table shows the number of mines in each county that produced coal in some part of the year, counting every one having separate ventilation and requiring separate inspection as one mine, also showing the month in which the largest output in each county was made:

COUNTY	Mines	Month
Bell . . . . .	6	November
Boyd . . . . .	8	February
Breathitt . . . . .	2	October
Butler . . . . .	2	October
Carter . . . . .	6	December
Christian . . . . .	1	October
Daviess . . . . .	1	December
Hancock . . . . .	1	November
Henderson . . . . .	5	December
Hopkins . . . . .	13	October
Johnson . . . . .	3	December
Knox . . . . .	7	January
Laurel . . . . .	14	January
Lawrence . . . . .	3	December
Lee . . . . .	2	October
McLean . . . . .	2	January
Muhlenberg . . . . .	8	March
Ohio . . . . .	9	January
Pulaski . . . . .	7	November
Union . . . . .	5	January
Webster . . . . .	4	October
Whitley . . . . .	20	January
Total . . . . .	124	

## FATALITIES AND INJURIES.

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The accidents of the year, as affecting the coal mine employes of the State, are greater in number than in any former year of this office. The death rate has been quite heavy as compared to recent years, but it is well to note that the number of operatives engaged, and the tonnage of coal produced, are materially greater than in former years, and on the basis of production the year's record is better than the ones made in 1888, 1889, 1890, 1891, 1893 and 1897, and compares favorably with that of 1894.

The banner year of the office in this regard is 1899, when but 7 deaths and 4,505,439 tons were reported, and the three next best years are 1898, 1896 and 1895, and they in the order just named. It is evident that such a basis is the correct one, as regardless of the forces and appliances used any business is hazardous just in proportion as the number of accidents bears to the results obtained in its operation. For example, I maintain, that the loss of ten men in the production of 2,000,000 tons of coal is more fatal than the loss of twenty men in the production of 5,000,000 tons, and if this be true, then the 17 deaths and the output of 5,020,675 tons during 1900 is a far better record than was made in 1891, with its 16 deaths and output of only 2,950,136 tons, and the same argument and ratio of fatalities to the tonnage for the other years named make them also more fatal than the year just closed. From the very nature of the business, it is inevitable that men will lose their lives in its employments, and the important question is, how to get the greatest amount of coal with the fewest number of accidents, and with this end in view, more than for mere statistics of output and forces engaged, different State governments have enacted laws taking supervision of the mines within their borders, and but for the multiplied dangers of

the industry, and its great importance to the commerce of the country and homes of the people, no government would enact such laws.

During the year there were reported to this office an aggregate of one hundred and nine noteworthy mine accidents, composed of the different classes as follows: Fatal, 17; serious, 27; and slight, 65.

In addition to these, as in all former years, there were a few minor or unimportant injuries, of which no special mention will be made.

The cause, class and number of the several accidents are given in the following table:

CAUSE.	Fatal.	Serious.	Slight.	Total.
Fall of top . . . . .	12	8	11	31
Fall of coal . . . . .	1	3	9	13
Mine shaft . . . . .	1	..	..	1
Mine cage . . . . .	1	2	..	3
Mine cars . . . . .	1	10	30	41
Mining machines . . . . .	..	..	5	5
Blasting . . . . .	..	1	4	5
Powder explosion . . . . .	1	..	2	3
Miscellaneous . . . . .	..	3	4	7
Total 1900 . . . . .	17	27	65	109
Total 1899 . . . . .	7	27	39	73
Total 1898 . . . . .	6	24	23	53
Total 1897 . . . . .	12	28	19	59
Total 1896 . . . . .	6	19	46	71

The following table shows the production of coal in the entire State each year since January 1, 1888; also the number of fatal mine accidents among the employes, and the tonnage to each death for each of those years:

Year.	Deaths.	Total Tons.	Tons per Death.
1888 . . . . .	14	2,384,898	170,350
1889 . . . . .	13	2,246,259	172,789
1890 . . . . .	11	2,532,526	230,230
1891 . . . . .	16	2,950,186	184,388
1892 . . . . .	8	3,027,297	378,412
1893 . . . . .	12	3,302,260	275,187
1894 . . . . .	10	2,957,195	295,719
1895 . . . . .	8	3,207,770	400,971
1896 . . . . .	6	3,182,478	530,418
1897 . . . . .	12	3,304,053	275,338
1898 . . . . .	6	3,542,182	590,355
1899 . . . . .	7	4,505,489	643,634
1900 . . . . .	17	5,020,675	295,384

Based upon the greatest number of employes working during any one month of the year, one employe out of the following numbers was killed or injured:

Class of Injury.	1898.	1899.	1900.
Fatal . . . . .	1,401	1,379	601
Serious . . . . .	350	357	378
Slight . . . . .	865	247	157

The causes that gave rise to the accidents, and especially to the many fatalities, are matters of greater concern to this office than the mere number or character of the accidents, as the death of one employe, from neglect on the part of those in charge of a mine, would, as to them, outweigh the loss of many employes from their own neglect. Responsibility in such cases can not be determined by the accident record, but whether great or small it may be fully discharged by the exercise of faithful efforts to discover and avoid the ordinary dangers of the business; and while deeply regretting the fatalities of the year, it is gratifying to note that not one of them was occasioned by explosive gases, nor from falls of top on any of the mine entries or haulways. The facts relative to the 17 deaths show that one was caused from falling down a deep mine shaft; and another occurred in a mine shaft by being struck with the cage; and one other was from fall of coal while mining down a standing shot; one was from explosion of powder; and yet another from falling under mine cars.

Of the 12 deaths from falls of top, 11, if not all of them, occurred at the working faces where the officials of this office can not be charged with responsibility, as they can not be present to witness the dangers incident to those places. It must be kept in mind that the working faces, whether in rooms or on entries, or in making break-throughs, or in drawing pillars and stumps, are constantly advancing, and that every shot and fall of coal exposes new places of danger that only the mine officials and the miners themselves can guard against. Three of the 11 deaths last mentioned took place while the parties were drawing pillars and stumps, which is known to be the most hazardous part of mining, and calls for extraordinary diligence on the part of those engaged, as well as the most constant vigilance on the part of the under-ground foreman.

The month, date, and cause of each death, and the name of the mine and county in which the same occurred, as reported to this office, are given in the following table:



No.	County.	Mine.	Month.	Date.	Cause of Death.
1.	Boyd . . . . .	No. 8 . . . . .	January	9	Fall of rock.
2.	Boyd . . . . .	No. 8 . . . . .	January	9	Fall of rock.
3.	Boyd . . . . .	No. 8 . . . . .	January	9	Fall of rock.
4.	Henderson . . . . .	Basket . . . . .	January	15	Pow'explos'in.
5.	Boyd . . . . .	No. 6 . . . . .	January	24	Fall of slate.
6.	Whitley . . . . .	Procter . . . . .	January	..	Fall of slate.
7.	Hopkins . . . . .	Reinecke . . . . .	March	2	Fell down shaft.
8.	Whitley . . . . .	Halsey . . . . .	April	3	Fall of slate.
9.	Whitley . . . . .	Dowlais . . . . .	June	5	Fall of slate.
10.	Knox . . . . .	North Jellico . . . . .	June	27	Fall of slate.
11.	Whitley . . . . .	Halsey . . . . .	July	27	Fall of rock.
12.	Bell . . . . .	Bennett's Fork . . . . .	August	22	Fall of rock.
13.	Union . . . . .	DeKoven . . . . .	September	1	Fall of coal.
14.	Webster . . . . .	Forsyth . . . . .	September	11	Mine cage.
15.	Hopkins . . . . .	Crabtree . . . . .	September	11	Fall of slate.
16.	Hopkins . . . . .	No. 9 . . . . .	September	..	Mine cars.
17.	Whitley . . . . .	Dowlais . . . . .	October	..	Fall of slate.

The facts and circumstances of the several deaths, as reported to this office, are now given in the order of their occurrence, and upon the evidence the public may pass judgment.

The first three deaths occurred simultaneously on January 9th, in No. 8 mine, Boyd county, operated by John Wurts, as lessee of the Ashland Coal & Iron Co. John O'Brien, Green O'Brien and Wm. Beaty, three miners, while working together in a room near the face, were killed by fall of rock. (Top.) Dr. A. H. Moore, coroner of Boyd county, empaneled a jury and held an inquest over the remains, and after hearing the evidence, the jury returned three separate verdicts as follows:



"We the jury, agree that the body before us is that of Wm. Beatty, and that he came to his death by falling rock in No. 8 mine, Boyd county, Ky., at 3 p. m. We also further agree that the accident was due to neglect on the part of John O'Brien to timber the room.

A. H. Moore,  
Coroner Boyd county, Ky."

"We, the jury agree that the body before us is that of Green O'Brien, and that he came to his death by falling rock in No. 8 mine, Boyd county, Ky., at 3 p. m. We also further agree that accident was due to neglect on the part of John O'Brien to timber the room.

A. H. Moore,  
Coroner Boyd county, Ky."

"We, the jury, agree that the body before us is that of John O'Brien, and that he came to his death by falling rock in No. 8 mine, Boyd county, Ky., at 3 p. m. We also further agree that the accident was due to neglect on the part of John O'Brien to timber the room.

A. H. Moore,  
Coroner Boyd county, Ky."

The loss of so many lives at the same time and place, and from the same cause, was so appalling that I dispatched my assistant, Mr. C. W. Logan, to the place of the disaster to make special investigation of the accident. His ascertainment of the facts and report thereon fully corroborate of the findings of the coroner's jury.

It appears that the said John O'Brien was in charge of the special work where the accident occurred. He was in the employ of Mr. John Wurts, the operator, and the other two men were merely in his employ. The three were turning a room, No. 17, off the second north entry blind, and had driven it about 22 feet, including the neck, which was started 8 feet wide, but after being driven about 8 feet, had been gradually widened until it was 15 feet wide at the face of the coal. There was a mud seam located

vertically next to the left rib about 5 inches wide, and which extended from the bottom to the top of the coal vein and on into the roof, which was a soft sandrock, and the coal was being taken out to this seam. The rock top was a shell about 10 inches thick on the side next to the mud seam, but which tapered to a feather edge at the right rib. The part that fell extended from the face of the coal 12 feet towards the mouth of the room and had been left unpropped, and it was liable to fall at any time of its own weight. The three men fired a shot in the face of the coal, which may have jarred the top and hastened the fall. A short time after this they went back to the face of the room and resumed their work, and while there the top suddenly fell, crushing them to death.

From the facts brought out by the investigation, and from the verdict of the coroner's jury, I readily conclude that the place, unsupported as it was by any props, had become a veritable "dead fall." It is evident that the setting of two or three props at most would have prevented the fall and saved the lives of these three men. The entire responsibility has been placed by the jury at the door of one of the unfortunate victims, and in the light of all the facts we can not change nor modify the decision, especially as he had the work in charge, and the necessity for props was plainly apparent.

No. 4. The fourth death was that of Wm. Green, of color, which occurred in Basket mine, Henderson county, on January 15th, from the explosion of a keg of powder. No one was immediately present, but from the best information obtainable it appears that he was opening the keg of powder with a pick, having a lighted lamp in his cap at the time. It is supposed that a spark from the lamp caused the explosion. He lived about 8 hours after the accident. He was 18 years old and unmarried.

No. 5. The fifth death occurred on January 24th, in Rush mine No. 6, Boyd county, when Marion Parsons, a miner, was killed instantly by fall of slate. He was working at the time in his room at the face of the coal. The piece that fell was a "kettle bottom," but its presence was not apparent. The room was prop-



ped to within 5 feet of the face. The deceased left a wife and four children.

No. 6. The sixth death was reported from the Procter mines, in January, the day of the month when it happened not being given. Henry Culbert, a miner, while pulling stumps was killed by fall of slate. He left a wife and two children.

No. 7. The seventh death occurred on March 2d, in the shaft of the Reinecké mine, near Madisonville, Hopkins county. The shaft is 300 feet deep. Henry Hite, of color, a loader, 19 years old, fell down the shaft and was killed.

No. 8. The eighth death occurred on April 3d, in the Birdeye mine at Halsey, Whitley county, where George Potter, a miner, was killed by fall of slate. He was 35 years old and left a widow and three children.

From the report of Mr. Evans, the mine superintendent, I give the particulars of the accident, which are as follows: Mr. Potter and one Jesse Lay, were working together in a new room on the left of the first place off the main heading. The left rib was parallel with a "hill seam" or "mud slip" in the top. The neck of the room was about 8 feet wide and had been driven about 8 feet deep. The place where their room branches off had 10 inches of top blasted down to give height for a loaded car. The slate was a hard gray substance with thin layers of sand through it. There was not a prop put in, though the foreman, Henry Goodson, had cautioned them, and spoke in harsh terms, to put in a few props as a precaution. Jesse Lay said: "I told George Potter to bring in 4 or 6 props and we would put them in, but Potter insisted that the top was good and therefore there was no need of bringing in timbers." Lay then pushed a loaded car to the entry about 30 feet distant, and before getting back he heard the fatal fall of slate. This was quickly followed by another. The pieces were about 10 inches thick and both caught the deceased, who was at the time lying on his right side at the face of the coal undermining the same with a pick.

No. 9. The ninth death was that of C. C. Goins, who was instantly killed by a fall of slate in the old mine of the East Tennessee Coal Co., Whitley county. No further particulars of the accident has been obtained, except that the deceased was an experienced miner, and at one time had held the position of bank boss for the company.

No. 10. The tenth death was that of Green Seivers at North Jellico mine, on June 27th, of injuries received from slate fall on February 9th. He was a machine helper and about 16 years of age.

No. 11. The eleventh death of the year was on July 10th, in Vanderpool mine, at Halsey, operated by the Whitley Coal Co. Robert Lefter, while engaged in drawing pillars, was killed by a falling piece of rock about three feet thick, and which was bounded by mud seams. He was considered to be one of the most skillful and experienced miners in the Jellico district. He was warned to quit working in that place on the day before the accident occurred, on account of the imminent danger, but early next morning, heedless of the warnings and the danger, he took the risk and resumed his work and commenced taking down the top, but with the third lick of the pick the fall came with the fatal results already told. He left a widow and three or four children.

No. 12. The twelfth death of the year was in Bennett's Fork mine, Bell county, on August 24th. P. Bronscomb while pulling pillars was killed by fall of rock. He was 21 years old and left a widow and one child.

No. 13. The thirteenth death of the year was on September 1st, in the DeKoven mine, Union county, operated by the Ohio Valley Coal & Mining Co. John Love, a miner, 47 years of age, while mining down a standing shot, was killed by fall of the coal. He left a widow and ten children.

No. 14. The fourteenth death occurred on September 11th, in the shaft mine at Providence, Webster county, operated by R. L. Forsythe, lessee of the Providence Coal Co. Thomas Garrison, a colored miner, was killed in the shaft by the cage being let down



on him. The accident occurred at 7 o'clock a. m. It appears from the evidence taken before a coroner's jury that was empaneled to inquire into the cause and manner of his death, that most all the men had gone down into the mine to commence their day's work. The mine was at work tipping coal, the cages being operated up and down the shaft. Garrison came to the top of the shaft and started to go down on the ladder without giving any warning to the top man, or to the man operating the cage. He was warned by a miner near him not to start, but paid no attention to the warning. He had just gotten on the ladder when the cage came down and instantly crushed him to death. He was 47 years old and left no family.

The coroner's jury, after hearing the evidence, returned the following verdict:

"September 11, 1900. We, the jury, find that Thomas Garrison (col.) came to his death by going down shaft on ladder, by being caught with cage, after being duly warned of his danger.

W. G. HIGHTOWER,  
JOHN SIGLER,  
F. L. KUYKENDALL,  
W. S. DODDS,  
J. W. EDWARDS,  
S. H. LUTON."

No. 15. The fifteenth death occurred at Crabtree mine, Hopkins county, on September 11th. Slate fell on George Samples, a miner, while mining down coal off a pillar in a break-through between two entries. He was taken home, a distance of one mile, but died within two hours after the fall. Two physicians examined his body and agreed that they could find no broken bones, or an injury that would have caused his death. It is stated that he died of heart disease with which he had been afflicted for three years, but it is evident that the scare and shock of the slate-fall produced the immediate condition from which he died. He was 20 years old and unmarried.

No. 16. The sixteenth death of the year was also in September, (date not given) and occurred in No. 9 mine, of the St. Bernard Coal Co., at Earlington. J. W. Day, who for many years had been foreman of the mine, was riding on the bank train of 24 wagons, and giving directions for the moving of the engine. He fell off and was found dead under the car on which he sat, and which had moved but half its length after he gave his final order to the motorman. It is supposed that he fell off the car between the time of giving the order and the starting of the motor. He was under treatment for heart disease.

No. 17. The seventeenth death of the year was in October, (date not given) in the new Dowlais mine, Whitley county, operated by the East Tennessee Coal Co. Richard Nicholas was killed by fall of slate while at work in his room which had been driven about 30 feet. The slate was loosened by slip which run "quartering" across the room. He was alone at the time. Evidently the fall came without warning. He left a widow and six children dependent upon him for support.

#### NON-FATAL INJURIES.

The following pages contain brief statements of the non-fatal injuries among the employes during the year without classifying them as serious or slight, except as may be indicated by the facts noted in each case, all of which are based on the reports sent to this office. The counties are taken in alphabetical order:

##### BELL COUNTY.

Excelsior mine, during May; Lewis Jones, foot mashed by fall of slate. At work again in a short time.

##### BOYD COUNTY.

Rush mine No. 6, on February 23d; Ben F. Lambert, leg broken while digging coal by fall of draw slate.

Also in above mine, November 6th; Thomas Tiller, a driver,

while helping another take down a standing shot, had his leg broken.

John Wurts mine No. 8, June 9th; Harry Wurts was run down by a mine car which dislocated collar bone, both ankle joints, also broke his leg and crushed his foot. July 10th, reported almost able to be out.

Also in above mine, November 30th; George Williams, leg and four ribs broken by fall of rock. He was working with his father at the time of the accident. At date of last report (January 11, 1901) he was able to sit up.

#### **CARTER COUNTY.**

Boghead mine, in May; B. Heron, a miner, was slightly injured about head and face by fall of top coal. He was working on stump at the time.

#### **CHRISTIAN COUNTY.**

Empire mine, April 19th; John Barnette, loader, right leg broken by slate sliding off top coal after it was shot down: He was loading at the time and saw the slate, which had been loosened by the shot and came down with the coal.

#### **HENDERSON COUNTY.**

Henderson mine, in March; Henry Tinnell, bank boss, arm broken near wrist from loaded car coming against post on which his arm was resting.

Corydon mine, March 19th; John McClure, while mining down a standing shot, started to pull down a slab of coal and draw-slate, which fell and caught his leg and broke it about 6 inches above the ankle.

Basket mine, October; W. H. Brown, slight injury to leg, and George Goode, slight injury to leg and arm, both from blasting.



## HOPKINS COUNTY.

St. Charles mine: January 15th; Edward and Robert Long, bruised and cut by fall of slate. Not serious.

Also above mine, January 20th; Ed. Wallace, arm bruised.

Also in above mine, May 29th; Robert Southers, machine helper, back and shoulders bruised by fall of slate.

Also another, whose name can not be made out, was caught and bruised by the same fall.

The following injuries were reported from the Arnold mine:

January, James Buckner, colored loader, was riding on a trip, but jumped off and was slightly injured by brake pulling him against rib.

February, Dave Hendricks, while riding on empty wagon, raised his head too high, and collar of coat caught in projection from roof. Back and neck sprained, and off 10 days.

May, Denny B. Davis, spine fractured from fall of roof; injury serious, but lost time not reported.

July, Will Hansbrough, while daubing brattice, back and head bruised.

October, Sam Wilkes, colored, driver, foot caught between bumpers of cars and bruised.

November, W. H. Sutton, colored driver, arm badly bruised by car jumping track and catching it between car and rib.

The following injuries were reported from the mines at Earlinton:

February, Horace Browers, back and hip bruised by fall of slate.

Also Lee Anderson, arm caught between rib and brake and bruised badly.

Also John Wyatt, foot injured from fall of coal.

March, Andy Carpenter, machine helper, head and shoulders bruised from fall of slate.

Also Louis Edwards, finger mashed between car and rib.



April, George Scott, bruised by fall of coal. Off 11 days.

May, Andy Carpenter, machine runner, while eating dinner was badly bruised from fall of slate.

Also, Albert Robinson, driller and shooter, fired shot, and returned for second shot and slate fell on him, breaking two ribs and badly bruising him.

October, No. 11 mine; F. O. Allison, bruised by fall of slate.

Also, Newell Harris, hand bruised by machine.

Also, Henry Harrison, hand bruised by machine.

June 4th, No. 9; Kemp Almon, car off track, foot bruised.

June 17th; Jo. Rycroft, scalded when cleaning boilers.

July, No. 9; Will Dick, driver, foot bruised in collision.

Also, James Morrow, hand mashed between brake and rib. Had left switch open.

August, R. E. Underwood, foot caught in switch; foot and ankle bruised.

Also, Arthur Bailey, arm caught between rope and car and bruised.

Also, George Thomasson, arm bruised by fall of coal.

December, No. 9; Will Long, arm caught between car and prop and slightly injured.

Harry Maxwell, machine cutter, hand caught between machine and rib bruised.

The following accidents were reported from Hecla mine:

February, John Wiley, bruised by falling off loaded car, caused by mule running off on down grade.

May, B. Hardin, car ran off track, caught foot, bruising it.

October, W. Walker, finger mashed by cars; and James Kelley, finger mashed by car brake. Mule ran away.

November, Charles Mour, machine man, slightly bruised in back by machine.

December, Henry Hill, thumbs caught between car bumpers.

The following accidents were reported from the Monarch mine:

February, 13th, Frank Smith, was mashed between car and rib. Off 10 days.

Also, February 5th, O. M. Overton, hurt by jumping on loaded car, and being caught between roof and car. Hip was dislocated. March 11th, out, but not able to work.

July, Elisha Black, colored, riding in front of his car, ran into another car; ankle mashed.

August, James Smith, timberman, timber fell on his foot and broke his leg at the ankle.

Also, Samuel Day and Alex Stuart, feet mashed by car running off track. Lost one week each.

Reinecke mine reports the following accidents:

February 15th, John Englehardt, squeezed between frame of door and mine car and bruised.

April 12th, Wm. Coleman, trapper, 16 years old, leg broken by mine car.

September 6th, Henry Bishop, foot caught in frog of switch and was run over by mine car and slightly mashed.

Barnsley mine, George Dockery, toes mashed by fall of coal.

Diamond mine, G. Browning, seriously injured by fall of roof; spinal column dislocated.

#### **KNOX COUNTY.**

East Jellico mine, April; Willie Johnson, was caught under haulage rope and had leg fractured. It was thought the disability would last two months.

June 15th, North Jellico mine; R. C. Birdine, leg broken in three places by fall of slate.

August 15th, West Jellico mine; Thomas Lumpkins, a miner 21 years old, while pulling stumps was hurt by pieces of slate from side, in consequence of which he unable to work until December 1st.

#### **LAUREL COUNTY.**

Pittsburgh mine, February 1st; John Higgins, leg broken between knee and ankle by mine car.

March 17th, Philip Higgin, foot slightly smashed by mine car.



December 31st, Lily mine; Wm. Schults, the bank boss, had fingers mashed by roller pulley, and Wm. Barker was struck with car and bruised about legs, and chin cut. He was following loaded trip up the slope after three drivers had begged him not to do so. After going up part of the way, one draw bar broke and the car came back on him. He said it was his own fault.

#### MUHLENBERG COUNTY.

March 8th, Central mine; Clyde Evans, walked under a descending cage, thigh broken. May 11th, report said: "Now walking about and almost well."

Mud River mine, May; Wm. Hussaker and son, burnt painfully but not seriously by accidental explosion of powder.

In Pierce mine, December 14th; Elsie Grable, small bone in leg broken by car jumping the track.

#### OHIO COUNTY.

Echols mine reports the following:

Arthur Reed, foot slightly mashed. Lost only a few days.

March 13th, Robert Sims, leg broken by fall of coal. April 6th, still not able to work.

May 21st, Anderson Summers, foot mashed by coal falling on it while loading car.

June, James Veller, foot slightly mashed by fall of coal.

Bert Hendricks, ankle slightly mashed between two cars.

July, N. B. Tarrants, foot mashed by fall of coal while taking down shot.

McHenry mine, March; Sam Reynolds, foot injured by fall of coal.

Above mine, May; Andrew Render, driver head hurt by being caught between coal on the car and the roof; injury not serious.

Also, December 1st, James Penman, foot caught between cars and slightly mashed. Lost 30 days

Also, Peter Taylor, fell from car and was bruised about the head. Lost 10 days.

Taylor mines, March 19th; Thomas Chinn, driver 17 years old,

leg broken by mule running off in the mine with car. It was thought he would be able to resume work by June 1st.

Render mine, May 5th; Wilson Russell, finger caught by machine. Off one week.

Also, October 5th; John Byers, machine runner, while timbering a room, leg injured by fall of slate. Off until October 29th.

#### UNION COUNTY.

January, Tradewater mine; loader, foot slightly injured. Lost 9 days.

DeKoven mine, March 14th; M. A. McClelland, loader, leg and ankle bruised by fall of slate. Painful but not serious.

Also, August 16th, Jacob Leibenguth, badly bruised by fall of slate. Lost one month or more.

Also, October 3d, Wm. Newcomb, a driver while riding on the front of a loaded car his light went out, and while trying to get off he fell in front of the car which ran over him, breaking one leg and bruising the other very badly. He was bruised very much all over.

Also, November 24th, Ed Irby and John Bennett, 40 and 23 years old, both coal loaders, while shooting down room of coal was hit by flying coal. Irby had leg broken, and Bennett was slightly bruised. They went back on the blast too soon, but just in time to come in contact with it.

#### WEBSTER COUNTY.

Providence mine reports slight injury to a miner, in June, while taking down slate to place timber.

#### WHITLEY COUNTY.

The following injuries were reported from the mines in this county:

Halsey mine, October; Ed. McGramer, finger caught between hook and mule trace and badly split. Lost three weeks.

Also, above mine, December 29th; Wm. Daughtery, was struck by mine car, and leg broken above knee. It was caused by mule



MINE.	County.	Tons.
Grinstead . . . . .	Whitley . . . . .	96,699
Strait Creek . . . . .	Bell . . . . .	95,606
Kensee . . . . .	Whitley . . . . .	94,787
Mt. Morgan . . . . .	" . . . . .	89,964
Mt. Ash . . . . .	" . . . . .	77,509
Cumberland . . . . .	Union . . . . .	72,392
Pineville . . . . .	Bell . . . . .	70,915
Eagle . . . . .	Pulaski . . . . .	64,802
Laurel . . . . .	Laurel . . . . .	61,362
Crescent . . . . .	Muhlenberg . . . . .	61,228
Williams . . . . .	Ohio . . . . .	60,086
Pitman . . . . .	Laurel . . . . .	59,353
New Diamond . . . . .	" . . . . .	55,517
Peach Orchard . . . . .	Lawrence . . . . .	54,359
Bevier . . . . .	Muhlenberg . . . . .	52,030

#### THE BANNER COUNTY.

On the same combined basis of tonnage, number of employes, and accidents, Carter has the best record and must be considered the banner county for the year 1900. With a force of 516 men, and the production of 215,824 tons, there was but one slight accident among its employes during the year.

## INJURIES TO MINE PROPERTY.

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During the year 1900, there were reported to this office two notable accidents to mine properties, one occurring outside, the other inside the mines.

On the night of October 21st, a serious fire occurred at the Render mines, located at Render, Ohio county, and operated by the Central Coal & Iron Co., resulting in the destruction of a large frame stable, together with twenty-five mine mules, three horses; a large amount of provender, and many other articles of smaller value. Only two mules of the entire lot were saved. The origin of the fire is not known. It was not discovered until after midnight, when it was too late to save the property. It is reported that the night watch was asleep in an adjacent building and was awakened by the alarm given by other parties. The losses of the company are estimated at \$3,000, and as a further result of the accident, mining was suspended for six days while waiting for another supply of mules.

### CENTRAL MINE.

The other accident referred to took place in the above named mine, located at Central City, Muhlenberg county, and also operated by the Central Coal & Iron Co.

During the month of May, there was a general squeeze, or fall of roof, covering about fifty acres on the east side of the mine, and shutting off all the workings on that side, of about one hundred acres. The fall came gradually and gave ample warning of its approach, so that it resulted in no personal injury to any one. Work was immediately begun with an adequate force to reopen and repair all the entries and haulways affected, so that

mining on that side of the mine could be safely resumed, and it was prosecuted vigorously and incessantly until December 3d, before mining was again commenced. A force of 60 men were at once employed in the re-opened district, and the visible results of the month's operations at the entire mine were the increase of the average working force from 156 to 272, and of the production of coal from 5,215 tons to 8,639 tons. However, taking the whole year and comparing it with the results of the previous year, we note a decrease in production of 44,544 tons, as well as a material decrease in the number of employes, mainly caused by this accident. Mining on the west side was never suspended. The losses of the company on account of the suspension and cost of re-opening the mine and general repairs and including the sinking of a new air shaft at the head of the main entry on the east side are estimated at \$30,000. With the completion of the new air shaft, the mine in all respects will be in most excellent condition, and its old-time production will again be reached.

Its production for the first three months of the year was: January, 13,835 tons; February, 13,228 tons, and March, 14,004 tons.

There was a strike among the employes over the general wage scale during the most of April, and only 1,472 tons were produced during that month.

## MARKETS, PRICES, WAGES, ETC.

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The natural environments of the Kentucky coal fields have been often published, and are too well known to need repetition in this report. They are serious impediments to production and profitable trade, though the one has been materially increased, and the other strongly maintained during the year just closed. These fields are remotely located from all the principal markets of the state, and have only railroad connection with them, and when their products reach these markets they are met with an abundant and most active competition from the great mining districts of the upper Ohio and its tributaries, that by reason of water transportation and favorable producing conditions very largely supply their demands, and at prices too low for much profit on our home products.

When our mine operators turn to other states they are confronted with the same strong competition from other coal districts, and it is with great difficulty that they gain a foothold, or supremacy, and in either case their profits are uncertain, and but small at best. These disadvantages being permanent must be dealt with as continual hindrances and be overcome, else our coal trade, as a producing industry, must decline and cease to be of much value to the state or country.

These adverse conditions ought to be well understood by all our people, and especially by all those engaged in the mining industry, for, like all others, it can not thrive without good markets, and good markets mean active demand and remunerative prices. Where there are no markets there are no producing industries with their various employments and multitudes of wage-earners, and it is equally true that depressed markets are necessarily attended with lesser production and lower prices, and lower wage scales.



If all the cities and towns of the State, that are located upon its several navigable rivers, had only railroad transportation, and this river trade were shut off, the production of our mines would be greatly increased, and much higher prices would prevail, and proportionate higher wages could be paid for all classes of mine labor, provided transportation rates remained the same as now. Such changed conditions would work corresponding hardships upon the people of those communities who are fortunately located with regard to their necessary coal supplies, as each channel serves as a check to the other, and if they did not have access to both markets, they would be worse off than the people of interior cities.

Notwithstanding all these hindrances our mine operators, during the past year, have largely increased their home trade and maintained themselves well abroad. The reports to this office indicate that 60 per cent. of the year's product, amounting to over 3,000,000 tons, was disposed of in some manner in this State, and 2,000,000 tons were sold out of the State; whereas of the 1899 product, only 57 per cent., or 2,545,000 tons, was disposed of in the State, and but 1,960,000 tons were taken out of the State.

Just how they have been able to do all this I do not know, except it be that important concessions in freight rates, to these competitive points, have been made by the railroad companies of the State; for if there had been charged a uniform rate for these long hauls, on the basis of the rates charged for distances to interior points, it would have completely shut our coal out of all these great markets, and seriously crippled great mining properties in production and values, and in some localities practically destroyed them, and left thousands of employes without the means of living, and their dependents in actual want.

I am persuaded that a thorough knowledge of all these conditions will lead to more easy and certain settlements of all mining scales, on terms that will be accepted as satisfactory and just to all parties concerned, and thereby in the future avoid strikes and suspensions and all the troubles and losses incident thereto, and that there may be constant work and wages to the labor, and satisfactory returns to the capital employed.

As labor can not live without the employments of capital, and as capital can not prosper without the operating and creative forces of labor, there are lines of proper adjustment for all their differences, and they ought to be sought out and applied, and then all their conflicts will cease.

Mine labor is exceedingly hard and discomforting, and is attended with many dangers to life and health, and it deserves the best wages possible, but it can not be paid more than the markets of the country justify, (though, in fact, wages may be too small on many lines) for capital in the hands of prudent investors will never be put into business enterprises that promise to end up in loss, and when invested, its first and inexorable law is self-preservation, and this may be expected, though it may involve its withdrawal from the channels of trade. In the business world, theories amount to nothing; it is conditions that govern the actions of men.

As to whether or not the railroad companies could carry all this traffic without loss, by making these long haul rates the basis for the short hauls to the interior points according to distances thereto, I am not able to say, but of which I express very grave doubts, but I venture an opinion that there is a middle ground that would be just to the companies, to the mining industry, and to the public in general.

It must not be forgotten that the people are interested in all these questions, for in the end they are the consumers and pay all the bills. The coal operators would readily, and to their own advantage, raise the mining scales to any price desired, if the people who buy their products were able to cash all these advances on demand. It is no argument to say that coal is a necessity and must be bought at any price, for so is food, and what would the world do if the farmers should combine, and say that man will die without food, and "all that a man hath will he give for his life," and then dictate prices that millions of worthy poor could not pay. The divine saying: "That no man liveth unto himself" is as true in trade as in individual life, and as all people and all busi-



ness enterprises are so dependent upon each other, the correct rule of action is to study and apply equitable rules of division between them all, of the joint earnings of capital and labor. "Live and let live" is an economic question that requires much study to master in the many departments of human life, and it requires as much honesty as brains in its general application. There is another thing necessary to success in the business affairs of life, and should be remembered by every business enterprise, and by every department of them, and that is, that none have a right to pull at but one end of the string, but must let the other fellow have his end, and make his pull. This will be the nearest approach possible to the "Golden Rule" method of doing business; however, this Bible gem is not found in all the business creeds of the country.

Most of the output of the Northeastern district, and that of Laurel and Knox counties, more than half of that of Bell, and 70 per cent. of that of Ohio county, were sold in this State. Of the immense tonnage of Hopkins county, 43 per cent. was used in this State, and 57 per cent. was taken out of the State, and about 53 per cent. of that of Muhlenberg and Union counties was taken out of the State, and 47 per cent. of it disposed of in home markets. Three-fourths of the tonnage of Christian county was sold out of the State. In the Western district the most of this export trade went into Memphis and Nashville, and to other cities and towns of Middle and West Tennessee, but some of it went farther South and to the Southwest.

Basing conclusions on the 1899 yearly reports from mines where none were received for 1900, about 55 per cent. of the tonnage of Whitley county was sold in the markets of Georgia and the Carolinas, though some of it stopped in Tennessee.

#### PRICE OF COAL.

In general, better prices were realized than in 1899, but the cost of production was also greater. Higher mining scales were paid, and the cost of supplies was greater, so, as a whole, the operators did not share very largely in the advance of the year. One large

company reports 15 per cent. increase in the selling price of coal, and the same increase in the cost of production. There were, however, some exceptions where the operators received substantial benefits from the raise. The employes seem to have gotten the better share of the general advance by increases in the wage scales, as is shown from the printed scale in force in Muhlenberg, Ohio, and other counties of the Western district, as published elsewhere in this report, and is also shown by the printed scale adopted at the Laurel mines.

As to the exact scale paid in Hopkins county, I am not informed, but from the constant work and large output, and the harmony that prevails in that county, I conclude that its employes have a "cinch" on a good thing, and propose to hold on to it, for which they ought not to be blamed, and in which they ought not to be disturbed.



## MINE IMPROVEMENTS.

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Under this head is included all material mine repairs and equipments, such as new fans, furnaces, air-shafts, mining machine and haulage plants, and machines, tramways, inclines, bank cars, screens, buildings and various other matters of greater or minor importance.

The improvements of the year have kept pace with the ever increasing demands of the mining industry, and indicate the ability and determination of the operators to utilize the latest and best facilities for quick and large production of this great Kentucky product, and we think that every invention and enterprise that tends to lighten the burdens of labor and lessen the price of production ought to be encouraged, especially when these desired ends can be accomplished without lessening the price of labor, and to this end we advocate machine mining, wherever possible, as the fastest and cheapest to the operators and of corresponding benefit to the public, while it materially decreases the dangers and burdens of the business without decreasing the wages of the employes. The hardest part of coal mining, and necessarily the slowest and most costly, is the use of the pick while kneeling down or lying on the side and undercutting the coal, and when this work can be done so much faster and easier and cheaper by the use of machines, I see no reason why the public at large ought not to rejoice in their adoption wherever available.

The reports from many of the leading mines were quite brief and unsatisfactory, and other mines made no report at all, but from the reports received from the operators and others, we now give a description of the chief improvements at the various mines during the year, taking the counties in alphabetical order.

**BELL COUNTY.**

The Pineville Coal Co. reports the making and almost completion of a mine entry, for the purpose of improving the mine drainage, at a total cost of \$1,500.

The Tuckahoe Coal Co. reports for its mine at Four Mile, the construction of a new mining plant, with engines, boilers, machines, tippie, slope, 12 houses, a commissary, etc., at a total cost of \$13,500. A fuller description of the new mine and plant is given in the chapter on "New Mines."

The National Coal Co. reports for the "Straight Creek" mine, the starting of a new mine entry, on which had been spent to January 1, 1901, \$2,500.

**BREATHITT COUNTY.**

The Kentucky Union Co. reports, for the mine at Jackson now operated by Mr. R. T. Davis, lessee, the opening of a new drift, and the erection of a new tippie and its equipment with revolving screens, all at a cost of \$2,500.

**BUTLER COUNTY.**

The West Aberdeen Coal Co. reports the erection of five new houses, and the purchase of seven acres of land, all of the value of \$2,500.

**CARTER COUNTY.**

The Ashland Coal & Iron Co. reports for its No. 10 mine: Started on its permanent incline and tippie on July 10, 1900. Six mining machines were added, 3 Ingersoll-Sergeant; 2 Sullivan and 1 Harrison.

**CHRISTIAN COUNTY.**

The Empire Coal & Mining Co. reports for its mine at Empire, the installation of one new Morgan-Gardner mining machine at a cost of \$1,000, and the putting in of a pair of new self-dumping cages, at a cost of \$450.



**DAVISS COUNTY.**

The New Holland Coal Co. reports a new pumping plant and a new hoisting engine and boiler at a total cost of \$2,000.

**HANCOCK COUNTY.**

M. H. Enright, who operates the mine at Adair, reports new cars and new track scales at a cost of \$400.

**HENDERSON COUNTY.**

The Green River Coal & Mining Co. reports for the "Rankin" mine at Spottsville: "Twenty-five coal cars, piping and rope haulage, etc., \$1,000."

The Corydon Coal Co. reports: "New pit head, \$600; new coal shed, \$600; new fan, \$100." Also the putting in of a new boiler and repairs on the old one at a cost of \$400.

The Peoples Mining Co. reports new screen, \$35, and other improvements, \$100.

**HOPKINS COUNTY.**

The Monarch Mining Co. reports: "One new mining machine, \$1,000; one new miner's house, \$400; one new electric pump, \$300; electric drill, \$275."

The Crabtree Coal Mining Co. reports for its mine: "Coal mining machine plant, comprising 2 boilers, compressor, etc., running 10 machines, cost about \$13,700. A fuller description of this new plant has been furnished the office by the Geo. D. Whitcomb Co., of 86 East Ohio street, Chicago, Ill., the manufacturers of the Harrison mining machines, and is as follows:

"This plant is composed of two 100 H. P. Erie City Iron Works Standard Tubular Boilers, 66 inches diameter by 16 feet long, each boiler having fifty-four 4 inch tubes. These boilers will operate the compressor, which requires 170 H. P. and leave a reserve of 30 H. P. for other purposes.

"One Norwalk Compound Air Compressor, having 22 inch re-

ceiving air cylinder, 13½ inch high pressure air cylinder, 20 inch steam cylinder, all by 24 inch stroke, this compressor having capacity to operate 14 mining machines.

"Ten class 'GGG' latest improved Harrison mining machines, together with the usual fittings for same.

"The power plant is located a short distance outside the mouth of the drift, and adjoining their rope haulage plant, the air is conveyed from the compressor into the mine with a 5 inch main pipe. This pipe runs into the mine for a distance of about 2,300 feet. From this point a 4 inch pipe will be extended along the main entry. In their cross or butt entries they use 3 inch pipe and in rooms 1¼ inch pipes. The rooms are worked about 22 feet wide.

"The coal is the standard No. 9 vein, except that in this mine it is somewhat thicker, running about 5 feet 4 inches in thickness.

"An experienced machine runner will undercut about three 22 foot rooms per day to a depth of 5 feet or 66 feet face to a depth of 5 feet, equal to 330 square feet of floor; 330 square feet of floor uncovered in a coal 5 feet 4 inches in thickness will release about 1,760 cubic feet of coal from the solid. Ordinarily about 27 cubic feet of coal in the solid is figured as a ton, therefore on this basis a machine will produce about 65 net tons run of mine coal per day, or to make some allowance for shrinkage, say 60 tons run of mine coal per day, therefore the ten machine plant worked single shift should produce 600 tons or if worked double shift 1,200 tons per day, if all machines were worked in rooms, but to make some allowance for some of the machines being in narrow work and some being operated by inexperienced men the plant is estimated to produce from 900 to 1,000 tons per day if the machines are worked double shift."

The Oak Hill Coal Co. reports the installation of a new electric Morgan-Gardner mining machine plant, with boilers, machines, etc., and new furnace, at a total cost of \$11,000. The plant consists mainly of one 75 K. W. generator; one 125 H. P. engine; two circular mining machines and all necessary connection; two 100



H. P. boilers, pumps and jettings. The plant was installed by the Morgan-Gardner Electric Co., of Chicago, Ill., and its operations are highly pleasing to the operators. The Oak Hill Co., in a letter to this office of date, January 9, 1901, in speaking of the plant, says: "June 1st we made a test run of the new machinery and every thing came up to contract, and the seven months' use we have given it has proven satisfactory."

The St. Bernard Coal Co. reports, for its various mines, the installation of six Harrison mining machines, and of one Morgan-Gardner machine; one new compressor, and the building of many new houses. They were also erecting a new rope haulage plant at Hecla mine.

The Reinecke Coal Co. reports a great many repairs and a general fixing up, including an extra new water pond, all costing about \$12,000.

#### **KNOX COUNTY.**

The East Jellico Coal Co. reports the putting in of a new fan; the cost not given.

The Knox Gem Coal Co. reports the opening and equipment of a new mine at Barbourville, at a cost, to that date, of \$20,000. A fuller description of this enterprise will be found in the chapter on "New mines."

#### **LAUREL COUNTY.**

The Standard Coal Co. reports for its mines at Viva: "Shaft and furnace, \$300; new houses, \$1,200," and inside mine repairs approximating \$1,000.

Bastin & Prichard, of East Bernstadt, report for the Star mine: One new side track, \$450; one large screen, \$100; water pipe and pump, \$150; and bank cars, \$125.

The New Diamond Coal Co. reports a new wire rope haulage plant over a track 2,500 feet long; the commencement of a new fan for mine ventilation, and other improvements, at a total cost of \$5,500.

**LAWRENCE COUNTY.**

Col. Jay H. Northup reports the reopening of the Torchlight Mine, at Walbridge, and the building of a tippie, track and incline, and repairing of houses, all at an approximate cost of \$3,000.

The Peach Orchard Coal Co. reports the opening and equipment of a new mine, at a total cost of about \$5,000.

**MUHLENBERG COUNTY.**

The Black Diamond Coal Co. reports, for its mine at Drakesboro, new shaking screen, new engine house, new tip head, improvements on boiler house, ten tons 35-pound steel rail on track, at a total cost of \$2,450.

The Mud River Coal, Coke & Iron Co. reports: 1,600 feet of steam pipe put in; the height of the main mine entry increased, and new timbers put in slope, at a cost of \$600.

The Central Coal & Iron Co. reports, for its mine at Powderly, a new air shaft and fan; a new pump, and an opening from the bottom of the shaft to the outside at water level for mine drainage, and which is used as a place for going in and out of the mine for men and mules, all at an approximate cost of \$1,500.

The Crescent Coal Co., at Bevier, reports the installation, by the Goodman Manufacturing Co., of Chicago, Illinois, of an electric mining and haulage plant of the Link Belt type, and of its equipment with all the modern, up-to-date appliances for fast mining. A fuller description of the plant has been furnished the office by the said manufacturing company, and is as follows:

**DESCRIPTION OF ELECTRIC MINING PLANT AT BEVIER.**

During the year 1900 the Crescent Coal Co. has equipped its mine at Bevier with a complete electric plant for haulage and machine mining. The plant was installed by the Goodman Manufacturing Co. and the completeness of the installation deserves special mention.



## POWER HOUSE.

The engine is a 17 x18 left hand automatic McEwen engine. It is capable of developing 192 H. P. at ninety pounds steam and one-quarter cut-off. It is equipped with a gravity oiling device which feeds oil from one main cylinder or oil cup to all the bearings of the engine. The feed to each bearing is supplied with a sight feed drip and regulating valve so that the amount of oil on any bearing can be regulated independently of all the others. The engine governor is of the well-known Begtrup Inertia type, which is used on all McEwen engines. The peculiarity of this type of governor is that the cut-off is held constant by the centrifugal force of the governor weights acting against a spring but any changes in speed of the engine affect the cut-off through the inertia of the governor. Any sudden change in load on the engine which would affect its speed causes the inertia bar of the governor to swing suddenly forward or backward, thereby increasing or decreasing the cut-off of the engine and holding the cut-off in this position till the original speed restores an equilibrium between the centrifugal force and the governor springs. As a consequence of the sensitiveness of this type of governor the engine will run at exactly the same speed at either full load or no load.

The dynamo is a 125 K. W. 250 volt machine, built by the Goodman Manufacturing Co. It is of the modern Multipolar type, having six internally projecting poles. The armature is laminated with ample ventilation throughout the armature core. The windings consist of formed coils bent on themselves at the back end so that there is only one joint in the winding which occurs where the armature conductors are soldered to the commutator. The series and shunt field coils are separately wound so as to insure ample ventilation between and around them and so that repairs may be made to either one without disturbing the other. The bronze bearings are carried in a ball and socket so as to be self-aligning and are lubricated by oil rings dipping into capacious oil wells, cored into the pedestal castings. The generator runs at a speed

of 550 revolutions. It is capable of carrying a full load of 125 K. W. for ten hours consecutively without heating more than 40 degrees over the surrounding air temperature, and is designed with a liberal margin of safety, which enables it to carry a 25 per cent. over-load for one hour, and 50 or 75 per cent. over-load for such short periods as are required in mining work.

In addition to the above the station is equipped with a marble switchboard, fitted with ammeter, voltmeter, circuit breaker and switch.

### MINING MACHINES.

For undercutting the coal five mining machines are now in use and more will probably be needed in the near future. These are the "Link Belt" machines of the Goodman Manufacturing Co., standard type. They are capable of undercutting the coal to a depth of five feet and each cut is 45 inches wide and four inches high. The general operation of chain breast machines is too well-known to need description, but some of the features of this machine are worth noting.

The main frame of the machine is carried on rollers so that when the cutter is withdrawn from the coal the weight of the motor and gears rests upon these rollers. These rollers are automatically locked in the operation of setting the jack against the roof so that when the machine is ready to be put in operation it is as steady as if the rollers were a part of the main frame castings.

The sliding frame is carried under the stationary frame so that when the bits are in motion they just clear the floor upon which the machine is standing. As a consequence the machine cuts a floor exactly level with that upon which it stands without leaving bottom to take up or a step in the floor, as is the case with a machine in which the sliding frame runs higher than the bottom of the stationary.

The motor is compound wound and automatically reduces its speed at heavy loads. This gives it a great advantage in hard cut-



ting as it uses less power with a heavy pull on the chain than any type of shunt wound motor which maintains the same speed at all loads.

### LOCOMOTIVE.

For haulage along the main entries a ten ton locomotive has been installed. This is of the "Independent" type, built by the Goodman Manufacturing Co. The feature of construction of this locomotive is that it is fitted with a single armature running lengthwise of the motor. This armature is geared by bevel gearing to both axles. This insures that all four wheels shall revolve simultaneously and with equal effort, which is indispensable for the best tractive efforts and impossible where two independent motors are separately geared to the two axles. As a matter of experiment this motor will exert at the draw-bar a horizontal effort of 6,000 pounds. This is 30 per cent. of the weight upon the driving wheels, and as ordinary types of locomotives will not exert over 20 to 25 per cent. of their weight it gives this type of machine an advantage of 20 to 30 per cent. over ordinary types of mine locomotives.

There is no separate truck to the locomotive. The magnetic frame of the motor is at the same time the truck of the locomotive, and carries the axles in bearings cored and babbitted into the two ends of the motor. This makes it possible to utilize all the weight of the main castings in a double sense and gives a powerful motor with massive castings and at the same time a rigid and substantial truck.

The controller is of the ordinary multiple type, having about fifteen steps, and equipped with a series break for dividing up the arc so as to reduce to a minimum the danger of flashing. The rheostat is composed of sheet iron strips built up in a log cabin fashion so as to allow ample ventilation between and around them.

The brakes are steel shoes acting upon the tires of the driving wheels. They are operated by a hand-wheel at either end of the

locomotive, which will stay in any position until released therefrom by the motorman.

The locomotive is equipped with sand boxes at both ends so arranged that either pair may be operated from either end of the locomotive without affecting the other.

A motorman's seat is set at either end of the locomotive and the motorman is protected from injury by massive castings around and behind him. All operating handles are double and so placed as to be within easy reach of the motorman in either of his two positions.

#### IN GENERAL.

Electric power is used for various operations in and around the mine. An electric driven centrifugal pump is mounted upon a mine truck and capable of being transferred from one sump to another for the purpose of pumping into the main sump at the bottom. The fan engine has recently been replaced by a motor. This is controlled from the switchboard at the power house 1,500 feet away. In addition to the regular instruments previously mentioned there has been installed on the switchboard a starting and regulating set for the control of this motor. The motor can be started, stopped, or its speed regulated by the engineer at the power house without the necessity of an attendant at the fan-house. The motor and fan bearings are self-oiling, so that it is not necessary for an attendant to visit the fan more than once in twenty-four hours. The construction and materials are of the highest grade, and the plant throughout is a good example of a modern electrical mine plant.

The Central Coal & Iron Co. reports for its mine at Central City: "Repairs on main East entry, timbering haulage road, etc., air shaft being sunk at head of this entry; approximate cost about \$4,000."



**OAKLAND MINE.**

One of the most necessary and material improvements of the year was the completion of the second outlet to the above-named mine. The failure to have it had been a matter of deep solicitude to this office for many months, and had been a matter of serious complaint upon the part of the employes of the mine. A complete history of the efforts and failures of the office to procure its commencement and completion, together with the visits made and warnings given, in order to get it, would read like a veritable romance, if it were not painfully true. After many and vexatious hindrances and delays, the announcement was made by the company that the outlet was completed on February 19, 1900. The outlet was made by connection with the Hillside mine, which adjoins the Oakland property. But we would not have it understood that the Oakland Coal Co. that had charge of the mine was in any sense, or to any degree, responsible for the trouble and delay in procuring the outlet, for, as far as this office has any knowledge or information, it holds the company entirely blameless in the matter.

**OHIO COUNTY.**

The McHenry Coal Co. reports for the mine at McHenry, about \$1,200 spent in extending the distance of the tail rope haulage. It also reports the enlargement of the main shaft at the Echols mine from 4 x 6 feet to 6 x 7 feet.

The Jamestown Coal Co. reports buildings and twelve bank cars, all the value of \$1,000.

The Taylor Coal Co. during the year finished its electric mine haulage plant, which was first commenced in 1899, and has it in full operation. It was installed by the Jeffrey Manufacturing Co. and the Baldwin Locomotive Works. Forty-pound steel rail tracks are laid in all the principal mine entries, over which is run one ten ton general electric motor with a haulage capacity of 800 tons daily, and one seven ton Jeffrey electric motor, having a ca-



capacity of 600 tons daily. The entire plant in operation does the work of twenty-one mules of the value of \$1,500. It is easy kept in repair and is giving perfect satisfaction. The economy of the plant is in its operation. By its use the original cost and the cost of feeding and care of the twenty-one head of mules are dispensed with. Besides, they are daily liable to more injury and damage from accidents than from use of the motors, and then they would soon wear out and their places have to be filled by new ones.

#### **PULASKI COUNTY.**

Cogar Creek Coal Co., at Flat Rock, reports new tip house and trestle, value \$200.

The Eagle Coal Co. reports for Barren Fork mine: Two thousand feet extension of dinky line, cost \$2,000, and other improvements costing \$300.

The Alpine Coal Co. reports twenty dwellings, at a cost of about \$1,500; one mine locomotive, \$2,300; and other minor improvements of the value of \$2,000.

#### **UNION COUNTY.**

The Ohio Valley Coal & Mining Co., at DeKoven, reports new machine shops and locomotive house.

The Paducah Coal & Mining Co. reports improvements of the value of \$7,000, but does not indicate in any manner their particular kind or value.

The Tradewater Coal Co. reports thirty-five new mine cars, value \$30 each, and three Ingersoll punch machines, value \$250 each.

#### **WEBSTER COUNTY.**

The Sebree Coal Co. reports screens, etc., value \$500.

The Providence Coal Co. reports the completion of its electric mining and haulage plant, at a cost of about \$8,000. Some no-

tice of this plant was given in last year's report. The motor was built for ten tons, but weighs by railroad weight 23,600 pounds. It has 75-horse power and was installed in August, 1900. It is run over a 35-pound steel rail track 3,200 feet long, and the track, with a 50-pound rail, will be extended the present season five hundred feet farther. The operation of the plant dispenses with the use of twelve mules and three drivers, and is giving perfect satisfaction. In a communication to this office received January 23, 1901, the company writes: "We think electric haulage a success and superior to any under-ground haulage. Have not had a single break or loss of time since installation, on account of plant."

#### WHITLEY COUNTY.

The Mt. Morgan Coal Co. reports the completion of its mining machine plant, at a total cost of \$16,000. A particular description of the same can be found in the 1899 report of this office.

I am satisfied that many costly and valuable improvements were made at numbers of other mines from which no reports were received. I think that this feature of the annual report a necessity in order to give the inquiring public a knowledge of the character of the mines, their equipments, etc. The showing made from year to year is certainly very creditable to the mining interest of the State, as they will no doubt compare favorably with the mines of like capacity in the other states of the Union. I hope that hereafter every operator will take pains to answer all inquiries of the office on these lines, as well as on all others.



### MACHINE MINING, ETC.

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Taking the past as indicative of the future, the Kentucky operators may be expected to use the best methods obtainable for mining their coal in every department of the work. Notwithstanding the many disadvantages of the field which make their profits uncertain and small at best, on account of unfavorable market conditions, as compared to the coal territories of adjacent States, they do not hesitate to try whatever appears to be feasible, and whenever the experiment proves satisfactory they are quick to adopt and use it until something better is presented. In this way the State is enabled to exhibit a large number of splendidly equipped mines, that will compare favorably with the best in other States, and produce coal with startling rapidity and ease.

The fastest and cheapest methods are always the best, especially when they are accompanied with a lessening of the burdens and dangers of the business, and incur no diminution in the price of labor. Such is becoming largely the spectacle in the Kentucky coal fields, where machine mining and haulage plants have supplanted the slowness and drudgery of the pick and the mule, and have become the dominant factors in the development of this great source of industry and wealth, and their good effects will be manifested more and more, and benefit the people at large in proportion as their use shall become universal.

There are mines and localities where their use are not practicable, on account of the expense or peculiar local hindrances, but as a rule, the Kentucky coal fields will admit of their employment, and I am glad to note great advancement on both these lines. It is no argument against their adoption, as some have urged, that they are the enemies of manual labor, on the idea that they decrease the chances of employment and thereby decrease the num-



ber of the employed and reduce the common benefits that rightfully belong to the labor classes of the country. If all this were true, the further facts that they dispense with the most burdensome part of the business, as affecting both man and beast, and decrease its dangers and bring such increased blessings to the people at large are more than sufficient to offset the argument and make just compensation for the loss. If such a sentiment were again to prevail we would have to do away with the benefits of all modern machinery, and go back to the days and ways of our fathers, before the blessings of modern inventions were made known to the world. But who wants to displace the self binder, that to-day reaps our fields, by the replacement of the old scythe and cradle, and the reap hook of fifty years ago, and who wants to reinstate the slow process of cloth making, through the spinning wheel and the kitchen loom of our grandmothers, in order to give a job to the mothers of to-day? Who would go back even two decades, before the giant and rapid power of electricity was so fully utilized as now, and again operate a street car line with the slow mule, and see him cruelly and quickly worked to death, that a market might be made for more mules, and be of special benefit to the farmers? The mining industry, so indispensable to every manufacturing and trade interest of the country, in common with every other branch of business needs every rapid and cheap facility possible in order to keep pace with the progress of all other business interests with which it has such vital connection. So the adoption of modern mining machinery in the various departments of the business must be regarded as fixed and permanent and destined to spread far beyond their present limits.

But in reality there has been no displacement of labor by the introduction of this machinery, but its operation and the enlargements of the general business have given re-employment to all this labor and avoided loss to any one.

During the year several mining and haulage plants were installed, and others are in progress or in contemplation of installment. Notable among them are the mining plants at Crabtree and Oak Hill mines, in Hopkins county, and the one installed for

the Crescent Coal Company at its mine at Bevier, in Muhlenberg county; also there is one in progress of construction by the Tuckahoe Coal Company at its mine, at Four Mile, in Bell county.

Among the haulage plants may be mentioned the one installed at Taylor mines, in Ohio county, operated by the Taylor Coal Co. In its entirety, except as to length of track, it is second to none in the State, being the only mine in all the State where two motors are employed for under-ground haulage. These electric motors, weighing respectively ten and seven tons, and having a daily capacity of 800 and 600 tons, do the hauling heretofore done by twenty-one mules, worth in the aggregate \$1,500. These mules had to be fed and cared for, and had paid drivers, and would be fit for use but a few years at most. The economy of the machine is quite apparent as all these facts are made manifest.

Other like plants were also installed during the year, or are being built, as is more fully detailed in the chapter under the head of "Mine Improvements."

The number of mining machines in use at the various mines can not be ascertained by merely adding the new ones introduced to the number reported for the previous year, as many wear out or are abandoned each year. The reports to this office in some cases were quite meager and unsatisfactory, but we have gathered from all the sources of information available, that during the year just closed, 36 new mining machines were installed, and are of the number, manufacture, and motive power, and distributed as now mentioned:

MANUFACTURE.	Number	POWER.
Harrison . . . . .	17	Compressed Air.
Ingersoll Sergeant . . . . .	6	" "
Sullivan . . . . .	2	" "
Link Belt . . . . .	6	Electricity.
Morgan-Gardner . . . . .	5	"
Total . . . . .	36	

The total number of machines in use in the entire State increased from 225 in 1899 to 240 in 1900, and there was marked increase in their production.

The following table shows the total tonnage and per cent of machine mined coal in the State each year since 1894:

YEAR.	Tons.	Per Cent.
1895 . . . . .	809,007	Nearly 26
1896 . . . . .	957,829	Over 30
1897 . . . . .	1,320,279	Nearly 41
1898 . . . . .	1,542,063	Over 48
1899 . . . . .	1,916,432	Over 42.5
1900 . . . . .	2,304,356	45.9

The following list contains the names of the several companies operating, in whole or in part, with machines; the number used by each company; the motive power employed, and tonnage of machine mined coal:



COMPANY.	Number.	County.	Power.	Tons.
St. Bernard Coal Co. . . . .	58	Hopkins . . .	Com. Air .	750,000
St. Bernard Coal Co. . . . .	3	" . . .	Electricity	
Monarch Mining Co. . . . .	5	" . . .	" . .	59,500
Oak Hill . . . . .	2	" . . .	" . .	20,000
Crabtree Coal Co. . . . .	10	" . . .	Com. Air .	235,105
Reinecke Coal Co. . . . .	8	" . . .	" . .	
Reinecke Coal Co. . . . .	5	" . . .	Electricity .	
Empire Coal Co. . . . .	7	Christian . . .	" . .	82,668
Hillside Coal Co. . . . .	4	Muhlenberg . .	" . .	45,890
Oakland Coal Co. . . . .	3	" . . .	" . .	43,885
Crescent Coal Co. . . . .	5	" . . .	" . .	25,600
Black Diam'd Coal & Mining Co.	8	" . . .	" . .	54,224
Central Coal & Iron Co. . . . .	7	Ohio . . . .	" . .	111,281
McHenry Coal Co. . . . .	11	" . . .	" . .	137,450
Taylor Coal Co. . . . .	15	" . . .	Com. Air .	130,273
Tradewater Coal Co. . . . .	13	Union . . . .	" . .	89,398
Ohio Valley Coal & Mining Co.	8	" . . .	" . .	50,000
Peach Orchard Coal Co. . . . .	8	Lawrence . . .	" . .	18,135
Ashland Coal & Iron Co. . . . .	12	Boyd . . . .	" . .	55,407
East Jellico Coal Co. . . . .	4	Knox . . . .	" . .	7,000
North Jellico Coal Co. . . . .	37	" . . .	" . .	213,630
Mt. Morgan Coal Co. . . . .	7	Whitley . . .	" . .	85,466
Pineville Coal Co. . . . .	3	Bell . . . .	Electricity .	28,366
Providence Coal Co. . . . .	2	Webster . . .	" . .	61,133
Total, 1900 . . . . .	240			2,304,356
Total, 1899 . . . . .	225			1,916,432
Tonnage of increase . . . . .				387,924
Per cent. of increase . . . . .				3.4

### SUPERINTENDENT OF THE MINE.

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Only the underground manager is referred to under this head, and he of the Kentucky kind, who, as a class, are as good as the best in the world. I mean the one familiarly known as the "Mine Boss," and him in every stage of his preparation and work, until after long years of active and difficult service he has reached the climax of his calling, and won for himself the distinctive title above named.

Like the craftsman in other pursuits, they vary in ability and educational attainments, as well as in efficiency and the success of their work. Some of them may be put down as rank failures, while others fail to develop their real worth for lack of time, or favorable opportunity; but it is not of these classes that I propose to write, but rather of that wide awake, progressive, and persevering class that have learned how to construct a mine, so that it may be operated with the greatest possible safety and comfort to all the forces engaged, and with profit to the owners.

In general, the mine boss is not a trained theorist, as he deals with conditions as he finds them to exist. His mine education has not come from books, nor from schools of technology, but from years of personal labor, observation, and object study, and from an intelligent application of all the things that he has seen and heard.

What he knows has not only been received and assimilated by him as a science, but it has been ground into him by practical experience, and from daily contact with every department of the under-ground work, until it has become to him a part of his being; a veritable fine art, ready for effectual and constant use.

In numbers of cases the successful superintendent has spent his life working in the coal mine. He commenced at an early age,

as a trapper boy, where he learned to control mine haulage and avoid delays, collisions, and the dangers and damages incident thereto; and when larger he drove the spike team and train of bank wagons, and still later he was found wielding the shovel and the pick. In this connection he learned to drill, tamp, and shoot down his coal, and how to discover and prevent dangers from the top, by a systematic posting of his working places. He also served a time at track making, and found out where it was best to take up bottom, or take down top, in order to have proper grade or entry height for the haulways. In turn he worked on the air-courses until he mastered the art of mine ventilation, and could properly locate the best places for the fan or the furnace and the airshaft. He cut ditches, made sumps, placed siphons, and erected pumps in aid of good drainage. After all these experiences he stepped out into the broader field of mine construction, and became a "Mine Boss," and as such he was suddenly transformed into the general all-around man of the mine. In this capacity he soon acquaints himself with every mine condition, and with every detail of the work, from the tippie and power house to the machine and pick at the working faces, where the coal is made. He soon knows every man under him by name, and the class and progress of his work, and his most valuable characteristic thereafter is shown in his ability to dissipate friction and promote harmony of action, so that when the mine runs, it will run in every part, like a perfect and well oiled machine.

There is, in fact, no man in any or all branches of the mining industry, whether in or out of the mine, so important and so necessary to its success as he, and certainly there is none charged with greater responsibilities or entitled to higher honors. He is the guardian for large invested capital, indirectly committed to his keeping, and the protector of the lives and health of the employes. It is not an inviting field, calculated to draw into its service ambitious young men who generally prefer choicer or more pleasant and profitable occupations, rather than one of such discomfort, drudgery and danger; but it is one that is highly honorable and



vitality necessary to the business of the country, and to the home-life of the people, and for his personal sacrifice and general business worth, the mine superintendent deserves the constant praise of his fellow citizens of every rank and avocation in all the land.

The mine operators are largely dependent upon them for the success of their business. They expect them to construct and maintain safe mines and so manage the inside forces, and every detail of the work, as to turn their investments into sources of profitable income; for of what value are the largest areas of rich and undeveloped coal, and the most extensive and costly appliances to mine and market the same, if, after all, bad engineering and mine construction shall turn the whole enterprise into a positive loss? To avoid such results the superintendent must study the character of bottom and top, and the depth and pressure of the hill or mountain under which the mine is located, and leave sufficient pillars to prevent a squeeze, and, in general, maintain safe conditions, that there may be continuous operations and the most rapid and the cheapest production possible.

In the end he is expected to display his skill and economic worth in robbing the bank of stump and pillar and saving them from perpetual loss. While the practice may not be of much profit to the operators, yet it avoids great waste, and are sayings and blessings laid up in store for generations yet to come.

Good mining engineering perfected in mine construction is the acquirement of numbers of Kentucky coal mine superintendents, and should be the ambition and attainment of all.

But in contrast with such officials and conditions, the writer has known mines that were closed up from general fall of top, and where large areas of valuable workings were shut off for months, and until reclaimed at large cost, all the result of bad construction. Such accidents ought never to occur, and never do where there is even ordinary good engineering.

But to obtain the efficiency and the success outlined in this article it requires many years of patient toil. It takes brain and muscle, and such energy of thought and action as will force the

man to the front in spite of all the difficulties, and make him a victor and a hero among all his craft. We say all honor to such, for they serve their country well and should have its plaudits.

From among a great number of good mine superintendents, I now introduce two to the public. (See photographs, etc., following this article.) They are not selected as the best in the State, but they are of the best, and there are none better, and but few that so fully as they represent the perfections of their chosen avocation.

The first one presented is Mr. Louis Feger, superintendent of the mine operated by the Reinecke Coal Company, at Madisonville, Hopkins county, Kentucky.

Mr. Feger was born in Dyersburg, Offenburg county, Germany, December 30, 1844. He was educated in the high schools of that city, but finished his education in the University of Friesburg, Germany, in which institution he graduated. His course of study embraced mining engineering. He came to America in 1866, arriving on March 24th. He went directly to the State of Illinois and commenced on a career of successful mine labor, that he has maintained ever since without a break or a blot. He commenced at the bottom round, and has built carefully and surely all the way to the present. For five years he worked in and around the mines, at the various kinds of labor, until he was proficient in every part. At the expiration of that time he was made the mine superintendent, which position he has filled with great success and credit to this day. In all, he has served the Reinecke Coal Company and its president, Mr. Reinecke, 29 years. He came to Kentucky in August, 1886, in the employ of this company, and superintended the opening of the Reinecke mines, at Madisonville, where he is still in charge as superintendent.

This mine is, perhaps, the largest in under-ground area, and, in fact, is the largest in production of any in the State; while in point of extensive and costly facilities for rapid production, it is not excelled perhaps in all the South. In all its parts, it is a marvel of perfect mechanism, that shows the mind and work of the



master, both in plan of construction and in the machinery and forces of its operations.

The inside work is the conception of Mr. Feger. He has made the mine. He has been on the inside what Mr. I. Bailey, as secretary and general manager, has been on the outside. He does his own mine engineering with precision, so that the mine entries and workings are laid off so as to aid in haulage and ventilation, and you will always find the mine in excellent condition. Two twelve-foot fans, one on either side, are used to force air into the mine. The current from each unite at the head of the main entry and go to the main shaft as a common outlet.

He makes with his own hands the mine maps showing the annual workings and the general progress of the excavations, and files them in this office as required by law. Under his supervision, recently there was installed a twelve-ton electric motor for underground haulage. It is run over a main track of 40-pound steel rails over a mile in length, which, added to similar tracks in the several cross entries, makes a continuous track, over which it is run, nearly five miles long. It is an inspiring sight and sound to stand at the bottom of the main shaft and look up the main entry, with its electric lights, and see and hear the approaching motor with its train of from forty to fifty bank wagons, each loaded with one and a-half tons of coal.

The whole mine is a model of completeness, highly creditable to the Reinecke Coal Company and its managers, and Mr. Feger may well be proud of his record as its superintendent, and no man should be so ungrateful as to pluck one honor from his brow, or throw a shadow over the dignity of his calling.

I next introduce Mr. Nicholas Barrass, the superintendent of the Taylor mine, Ohio county, operated by the Taylor Coal Co. Mr. Barrass was born in Northumberland county, England, October 24, 1844. As to his opportunities for education I am not informed, but he seems to have been less favored in this regard than many youths of his day and country; however, he has been eminently



successful in every department of his chosen life work of coal mining.

When eight years old he moved with his father and family to the county of Durham, where, at the age of eleven years, he started in the mines at his first work as a trapper boy for the Hatton Coal Company, where he labored at all kinds of boy's work until he reached the age of seventeen years, when he commenced to mine coal. He followed this for six years, and in April, 1870, he came to the United States, where he has ever since resided. He first went to the State of Ohio, and worked at his occupation for two and one-half years. In 1872 he came to Kentucky and engaged in coal mining at Mercer Station, in Muhlenberg county, for seven months, and from there he went to McHenry mine, in Ohio county, until twenty-three years ago he was put in charge of the Taylor mines, where he has continuously lived and labored to this time as its superintendent.

He represents, perhaps, more fully than Mr. Feger the successful superintendent, from the mere standpoint of practical labor and observation, though, in fact, no better than he on any line of the work, and like Mr. Feger he is an exemplary and valuable citizen of his adopted state and country.

Taylor mine is of immense proportions, though not so large or productive as some others. Yet in point of general and special equipments, for easy and profitable operations, it compares favorably with any in the State. In addition to the large mining plant, as described elsewhere in this report, it contains nearly one and one-half miles of 40-pound steel rail track for under-ground haulage, over which are run two electric motors, of ten and seven tons weight, respectively, that collect the coal from all the remote entries and haul the same to the foot of the slope.

The mine is well ventilated and drained throughout, though the light cover makes the latter very difficult in parts of the mine after seasons of protracted rains. The mine entries are always clean of gob, and made easy and safe for passage. In fact, this mine is regarded as the model one in all that section, and it has

become a common saying, among the employes of the various mines, that "Taylor mine is all right, and Nicholas Barrass is all right."

Like Mr. Feger, of the Reinecke mine, he makes his own mine maps with unusual accuracy and neatness, showing the annual progress of the mine workings, and files the same in this office as a State record.

His long and faithful services testify to his general worth as a citizen and mine official more vividly and potently than tongue or pen can describe, and will ever remain as a monument of honor to him in all that country.

It is well to add that frequent changes of superintendents are always followed by bad mine conditions. The writer has noted this in a number of instances, where the newly installed "Mine Boss" apologized for the mine, but laid the blame for bad conditions on his predecessor, who had just gone out, and he invariably promises the most perfect conditions possible in a short time; but the next round finds him gone, and a new boss in charge, when the same apology and promises are made as to mine defects that have never been remedied.

In mining, as in all other business, it pays to keep competent and faithful men in charge, as incompetency begins and ends with inefficient management and certain loss.

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LOUIS FEGER,  
SUPERINTENDENT OF REINECKE MINE.  
MADISONVILLE, KY.

JANUARY, 1901.



NICHOLAS BARRASS,  
SUPERINTENDENT OF TAYLOR MINE,  
OHIO COUNTY, KY.





## STRIKES.

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### WESTERN DISTRICT.

There was a general suspension of mining in several counties of the western district during the most or all of April, pending the adjustment of a general wage scale for the ensuing year, an increase and some other matters having been demanded. The effects of the suspension are plainly shown by a comparison of the output of the counties mostly affected for the months of March, April and May. During these months, when normal conditions prevail, the output of March is larger than that of April, and still larger than that of May.

The production of Ohio county for the three months named is as follows:

	Tons.
March . . . . .	53,865
April . . . . .	10,581
May . . . . .	41,313

It is fair to estimate a loss of 35,000 tons in April alone, as 45,000 tons or more would certainly have been produced had there been a full month's work. Again, it is well known that the effects of a strike are rarely overcome under two or three months, and it is reasonable to estimate a loss of 50,000 tons in this county on account of the suspension.

The four largest mines in the county were affected as follows:

MINE.	MONTH.	Tons.
Taylor . . . . .	March . . . . .	13,205
Taylor . . . . .	April . . . . .	3,426
Taylor . . . . .	May . . . . .	9,108
Render . . . . .	March . . . . .	11,699
Render . . . . .	April . . . . .	2,679
Render . . . . .	May . . . . .	9,946
McHenry . . . . .	March . . . . .	10,293
McHenry . . . . .	April . . . . .	2,788
McHenry . . . . .	May . . . . .	9,514
Echols . . . . .	March . . . . .	8,081
Echols . . . . .	April . . . . .	.....
Echols . . . . .	May . . . . .	7,130

The remaining mines in this county were affected in like proportion to the above.

The effects of the strike were even more manifest in Muhlenberg than in Ohio county, as the following tonnage indicates:

	Tons.
March . . . . .	50,758
April . . . . .	4,298
May . . . . .	21,907

Central mine fell from an output of 14,004 tons in March to only 1,472 tons in April, while Powderly mine fell from 4,801 tons to nothing, and the Memphis mine, now operated by the Crescent Coal Co., fell from 7,675 tons to nothing in April. Pierce mine produced 5,772 tons in March and none in April, while Bevier mine fell from 7,240 tons in March to only 500 tons in April, and Hillside and Oakland mines produced less than one-fourth as much in April as in March.

Union and Henderson counties were also largely affected. Their tonnage for the three months named was as follows:

COUNTY.	MONTH.	Tons.
Union . . . . .	March . . . . .	25,153
Union . . . . .	April . . . . .	7,025
Union . . . . .	May . . . . .	19,125
Henderson . . . . .	March . . . . .	13,310
Henderson . . . . .	April . . . . .	5,754
Henderson . . . . .	May . . . . .	5,965

The production for the entire district for the three months was as follows:

	Tons.
March . . . . .	228,159
April . . . . .	150,106
May . . . . .	212,025

In striking comparison with the above figures I now give the tonnage of Hopkins county for March, April and May, as follows:

	Tons.
March . . . . .	118,021
April . . . . .	107,085
May . . . . .	105,743

An agreement was reached between the operators and miners on April 18th, some increase having been granted, but the mines were slow in resuming work, and many of them were idle until May, and some of them even later.

The general effects of these strikes are far-reaching, affecting alike the business interests of the county and the welfare of multitudes of people, other than those engaged in mining, and are matters of grave concern to the general public. As to questions of profit or loss to those engaged, or whether or not the



end justifies the means, I shall not undertake to decide, but content myself with publishing the facts so that those interested may figure on the profit and loss question at their own pleasure.

The wage scale as adopted is to be in force until March 31, 1901, and is as follows:

#### CENTRAL KENTUCKY DISTRICT AGREEMENT.

Central City, Ky., April 18, 1900.

The operators and miners of the Western Kentucky Coal Field, in joint session, hereby adopt as the agreement for the ensuing year ending March 31, 1901, the Central City Agreement of 1899, without change, except as follows:

Resolved, The price for mining per ton over the District Standard Screen and all other rates of wages fixed therein, shall be increased 13 2-3 per cent.

The price per ton for Mine Run of Fordsville block coal shall be fixed by test.

Both parties to this agreement concede the fairness to all concerned of the principle of equalization of wages under like conditions in the same competitive district and in compliance with this principle it is agreed that the scale of wages hereinbefore fixed shall be supplanted by a new scale equivalent under like conditions to any rate of wages in excess of this scale with the U. M. W. of A. may enforce uniformly throughout this Western Kentucky district, but this new scale in no event shall be in excess of the Indianapolis scale of 1900; and further, in the event of the non-union mines in this Western Kentucky competitive district representing not less than eighty (80) per cent. of the normal output of said non-union mines, being on strike, and closed down so that no coal is produced for market for thirty (30) consecutive days, then shall the scale hereinbefore fixed be supplanted by a scale of 80 cents per ton for mining over the District Standard Screen and the rates fixed in the Indianapolis scale of 1900 for

all other labor take effect at the expiration of the said 30 days, and continuing during the period of said strike, shut down and non-production of coal.

### PICK MINING.

#### RESOLUTION NO. 1.

Resolved, That the price of pick mining for the year ending March 31, 1901, shall be 75 cents per ton over the District Standard Screen (12 feet long, 5 feet wide,  $1\frac{1}{2}$  inch space between bars,  $\frac{5}{8}$  inch face). It is distinctly understood that when any company uses a shaker screen that screens more than a standard screen, they shall weigh coal in the cars on a run of mine basis. It is agreed that the ratio of lump coal to mine run over  $1\frac{1}{2}$  inch District Standard Screen, shall be based on 62 per cent. going into the weigh box, and this per cent. shall regulate the ratio of lump and run of mines coal whenever any change is made in the price of mining.

That the mine run price shall be  $46\frac{1}{2}$  cents per ton, an equivalent of 62 per cent. of 75 cents per ton, the price of lump coal.

It is understood that coal shall be mined  $2\frac{1}{2}$  feet, and the solid may be shot not more than an equal amount, except at Spottsville, where miners shall mine coal as much as possible.

It is understood that the above prices apply to all veins that have been recognized as No. 9 or its equivalent.

#### RESOLUTION NO. 2.

Resolved, That the price of yardage in entries shall be \$1.14 per yard, but when the entry exceeds 10 feet and is not more than 12 feet, the price shall be 85 cents per yard, and no yardage shall be paid in excess of 12 feet.

All break-throughs driven entry widths shall be paid for at entry prices. Should the bank boss and the man driving an entry agree that it is wet, then the miner shall receive  $28\frac{1}{4}$  cents per yard extra.



## RESOLUTION NO. 3.

Resolved, That the price of turning rooms shall be \$3.40 per room.

## RESOLUTION NO. 4.

Resolved, That the price for drilling, shooting, loading and timbering after chain and punch machines shall be one-half the price of pick mining; the companies using the chain machine to pay such additional price per ton for bradding the coal, handling the slack and taking up the bottom as can be agreed upon by the mines affected, or have it done by the day.

## RESOLUTION NO. 5.

Resolved, That chain machine runners and helpers shall be paid at the rate of \$4.25 per 27 cuts, under ordinary conditions, divided:—\$2.25 to the runner and \$2 to the helper, and when they work by the day the runner shall receive  $28\frac{1}{4}$  cents per hour and the helper 25 cents per hour.

It is understood that 14 square feet shall constitute a cut for the 5-foot machine, and 17 square feet shall constitute a cut for the 6-foot machine.

Resolved, That punch machine runners shall receive  $28\frac{1}{4}$  cents per hour and the helper shall receive  $21\frac{1}{4}$  cents per hour when they work by the hour.  $10\frac{3}{4}$  cents per ton of screened coal to cutter;  $6\frac{1}{4}$  cents per ton of screened coal to helper; or 1.14 cents per square foot to the cutter and .0068 to the helper.

## RESOLUTION NO. 6.

Resolved, That the yardage for chain and punch machines shall be 57 cents per yard for 3 runs and  $42\frac{1}{2}$  cents per yard for 4 runs, to be divided as follows:—40 cents to the loader, 9 cents to the cutter and 8 cents to the helper in chain machine mines when 3 runs are made, and in the same proportion when 4 runs are made.



Punch machine mines shall pay 30 cents to the loader, 16 cents to the cutter and 11 cents to the helper when the entry is less than 10 feet, and in the same proportion when the entry is 12 feet.

No yardage shall be paid by either machine company when the work is done by the day nor when entries are more than four runs wide.

RESOLUTION NO. 7.

Resolved, That turning rooms in machine mines shall be paid for by the yard, as per Resolution No. 6, divided between loaders, helpers and cutters, when not working by the day.

RESOLUTION NO. 8.

Resolved, That where a man or a man and a boy are loading after a machine and not claiming more than a turn and a half, they shall be entitled to 2 rooms where practical.

RESOLUTION NO. 9.

Resolved, That the companies shall lay all roads and timber all bad places not caused by the miners' own negligence.

RESOLUTION NO. 10.

Resolved, That a square turn shall be kept all over the mines in rooms and narrow work under ordinary conditions. Half turn to boys between 12 and 16 years of age.

RESOLUTION NO. 11.

Resolved, That miners absent from their working places for three consecutive days shall forfeit their working places, and any day man absenting himself without reasonable excuse shall forfeit his working place.

RESOLUTION NO. 12.

Resolved, That any miner loading an unusual amount of slate, sulphur or other impurities, shall be laid off one day for each of-

fense. The weigh-master and check-weighman to be the judges of such unusual amounts, and any miner laid off for three days during any one month shall then be subject to discharge.

## RESOLUTION NO. 13.

Resolved, The check-weighman shall have a number to run his account and shall be allowed to cut each miner for his own wages and for all dues and assessments of the U. M. W. of A., provided that in the case of dues and assessments each employe shall give a written order authorizing the employer to make such cuts. Similar cuts for day men shall be collected on the same condition through the office.

## RESOLUTION NO. 14.

Resolved, That no mass meeting shall be held during working hours, on or off the company's premises, when the mine is running, and any one calling a meeting shall be subject to discharge.

No committee shall visit any employe at his working place except in company with the bank boss to settle a grievance, and any employe caught out of his working place during working hours, except for satisfactory reasons, is liable to have his turn stopped, at the option of the bank boss.

## RESOLUTION NO. 15.

Resolved, That all labor shall be paid for by the hour or quarters of hours, and that 8 hours shall constitute a day's labor, so far as mine laborers and miners are concerned, but the eight hours shall not affect the engineers, firemen, pumpers, outside teamsters, night watchmen, blacksmiths or special repair work, nor such men as are now paid by the month.

That an 8-hour-day means 8 hours work in the mines at usual working places for all classes of day labor and miners, and any miner late, without reasonable excuse, shall forfeit his turn



for the day. This shall be exclusive of the time required in reaching working places and departing from same at night.

Regarding drivers, they shall take their mules to and from the stable, and the time in so doing shall not include any part of the day's work, their work beginning when they reach the change at which they receive empty cars, but in no case shall a driver's time be docked while he is waiting for such cars at point named.

It is distinctly understood that the time of starting the run each day depends on the arrival of railroad cars, and that the 8 hours run shall be counted from the time of starting, provided the run begins within two hours from the regular starting time.

It is also understood that miners and day men will respond promptly to the starting time, and that no shooting shall be done until 9 hours after the starting time, subject to the penalties of Resolution No. 18, as hereafter provided.

The following scale of wages shall be paid for inside work:

Tracklayers . . . . .	\$2 00
Tracklayers' Helpers . . . . .	1 82
Trappers . . . . .	57
Bottom Cagers . . . . .	1 82
Drivers . . . . .	1 82
Riders . . . . .	1 82
Water Haulers . . . . .	1 82
Timbermen . . . . .	2 00
Pipemen . . . . .	1 92
All other inside day labor . . . . .	1 82

The present outside scale of wages, \$1.28 per day, shall be the minimum wage for work about the mine.

That there shall be no boys employed as drivers except on straight track, and said drivers shall receive 25 cents per day less than the district scale.

#### RESOLUTION NO. 16.

Resolved, That the price for blacksmithing at pick mines shall be \$ .0134-100 per \$1 earned by each miner, and at machine mines blacksmithing shall be 67-100 cents per \$1 earned by each miner.



## RESOLUTION NO. 17.

All employees affected by this agreement shall be paid on the first Saturday after the 10th of each month for the labor performed during the latter half of the preceding calendar month, and on the 28th of each month for labor performed during the first half of the current month. This second payment as provided above shall be in the nature of a cash advance in even dollars.

## RESOLUTION NO. 18.

Resolved, That employees are liable to be discharged for:

- a* Disorderly conduct.
- b* Gambling and shooting on the company's premises.
- c* Taking coal, tools, timber, etc., without permission.
- d* Firing before the run stops without permission of the bank boss.
- e* Committing a nuisance in entries, air-ways or necks of rooms.

## RESOLUTION NO. 19.

Resolved, That in case of a death in the family of an employee, or upon the death of an employee, the following rules shall prevail:

- a* Death by accident in or around the mines, the mines shall lay idle until after the funeral.
- b* Death of a grown person or employee from natural causes, the mine will lay idle on the afternoon of the funeral.
- c* On the death of a child or minor, the work will not lay idle, but those wishing to attend the funeral may do so.

The turn lost by the grave diggers in the last two rules shall be made up to them during the month.

## RESOLUTION NO. 20.

Resolved, That married men shall at all times form the majority of all committees.

## RESOLUTION NO. 21.

Resolved, That in all conferences, the employes of each mine, or especially the mine affected shall be represented by not less than three employes of such mine, and that the voting power shall always be vested in such employes, but this does not preclude the presence of any officials of the labor organizations.

## RESOLUTION NO. 22.

Resolved, That there shall be a Board of Conciliation and Arbitration, to adjust all disputes, both local and general, arising under this agreement, composed of three on each side, with power to select an umpire, and their decision shall be final and binding, on all parties to this agreement and those they represent, but under no circumstances shall work stop before the decision of the arbitrators is received. Such suspension will be sufficient cause to discharge the mine committee and the party or parties causing the dispute, unless the committee show they have used due diligence to keep the men at work.

## RESOLUTION NO. 23.

Resolved, That this agreement constitutes the only agreement between the miners and operators of this district, and that there shall be no demands made locally that conflict with this agreement.

Resolved, That this contract goes into effect April 1, 1900, and continues in force until March 31, 1901.

In witness whereof we have hereunto subscribed our names this 18th day of April, 1900.

## Miners—

J. D. WOOD, Pres't Dist. 23.  
C. BARNABY, Vice-Prest.  
W. J. CAMPBELL, Secretary.  
G. W. PURCELL, Mem. N. Ex. B. U. M. W. of A.

## Operators—

I. P. BARNARD, President.  
W. G. DUNCAN, Vice-Pres.  
GUY M. DEANE, Secretary.

**SOUTHEASTERN DISTRICT.**

There was a suspension of some weeks during September and October, in many of the mines of Whitley, Laurel, Bell and Pulaski counties, over a disagreement as to the district wage scale, a general increase being demanded, as well as some matters of minor importance. The results of the suspension, as affecting the tonnage of the counties, are plainly apparent from a statement of their output for August, September and October, which is now given:

COUNTY.	Months.	Tons.
Whitley . . . . .	August . . . . .	55,922
“ . . . . .	September . . . . .	30,997
“ . . . . .	October . . . . .	57,859
Laurel . . . . .	August . . . . .	38,648
“ . . . . .	September . . . . .	2,738
“ . . . . .	October . . . . .	20,587
Pulaski . . . . .	August . . . . .	8,859
“ . . . . .	September . . . . .	2,627
“ . . . . .	October . . . . .	11,089

Knox county was affected but little. Its output for the three months was as follows:

	Tons.
August . . . . .	27,342
September . . . . .	24,648
October . . . . .	28,642

Under normal conditions the output of September would have been equal to, if not greater, than that of August, but considerably less than that of October.

The general effect in the entire district for the three months is shown by the total tonnage, which is as follows:



	Tons.
August . . . . .	149,092
September . . . . .	70,486
October . . . . .	135,119

Some increase was granted, but whether it was uniform over the district, I can not say.

The following agreement was entered into at the Laurel mines, at Pittsburg, Laurel county, which likely is a fair indication of the remainder of the district:

Contract entered into between Laurel Coal Co. and their employees: This contract commences September 1, 1900, and expires August 31, 1901.

Scale of prices for mining, 75c. per ton over present screens; 55c. per ton run of mines.

Entries per yard, \$2.05.

Airways and break throughs where ordered, 55c. per yard.

Room turning, \$2.25.

#### DAY LABORERS.

1 mule inside, \$1.65 per day; 1 mule outside, \$1.60 per day; spike teams, \$1.85 per day; track layers, \$1.85 per day; tippers and trimmers, \$1.55 per day; trappers, 60c. per day; pick sharpening, 40c. per month; auger bits, 7½c. each; 23c. per set.

Any employe wishing to quit the company after 10 days' notice to the company and surrendering all property belonging to the company, shall be entitled to his full pay, including work done during the 10 days' notice.

Pay days on Saturdays nearest 1st and 15th of each month.

Any disagreement between the bank boss and the employees which they fail to settle shall be settled by arbitration.

Boys 14 to 16 years old to have one half-turn; over 16 years old

full turn. No boy to be allowed this privilege except boys of miners or mine labors.

House rent to remain same as last year.

All other labor not mentioned,  $7\frac{1}{2}$  per cent. over last year's scale.

There shall be no discrimination between union and non-union men.

Signed this day, October 2, 1900.

LAUREL COAL COMPANY,  
Per J. W. BASTIN, Gen. Man'gr.

S. W. ROCKWELL,  
ROBERT BROWN,  
FRANK ROURKE,

Com. for Employees.

### THE WOLF SAFETY LAMP.

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Gas in dangerous quantities is of rare occurrence in Kentucky coal mines now in operation. Most of the mines are drifts or have but little cover, in which explosive gases are almost entirely unknown; but a few of them are thus affected and require constant and careful effort to avoid the dangers incident thereto. Wherever fire-damp prevails the open lamp is a menace to safety, and has often caused disastrous explosions, resulting in great loss of life and property.

The Western Kentucky coal field embraces a large area, that lies at great depth, and is known to yield much of this gas. I have in mind one mine that was located in a five foot vein of excellent quality, and which was reached by a shaft over 400 feet deep, but which has been idle for 12 years past because of the amount of gas encountered in its operation. That this mine, and all others similarly situated (and the territory admits of many like it) also the deeper coal veins of that section can be safely and successfully worked, and made productive and profitable, I have not the slightest doubt.

Aside from bad mine construction, caused by inefficient engineering, and careless and reckless mining, there are two principal elements of danger, fire-damp and coal dust, to be avoided in all such mines. The latter must be kept wet down, so that its agency for danger, in case of excessive heat from a blown out shot, may be averted, and the former must be expelled by strong air currents, or its presence overcome by other effectual means.

Mines located in coal veins that are exceedingly fiery, and where pockets of the pent up gas may be found and let loose, whenever work is in progress, can never be regarded as safe when exposed to open lights, and ought never to be operated except



with lights from the most tried and approved safety lamps. Centuries of experience, fraught with risk and direful calamities, have long since demonstrated these truths to the world.

It is evident, in fact, beyond controversy, that the dangers encountered in working these mines can be reduced to the minimum, if not entirely overcome, if the proper precautions shall be exercised in lighting them. As a matter of course there must be good ventilation and proper mine construction as necessary concomitants. The solution of the question lies in the adoption and use of an effective safety lamp.

As to which, among the many inventions in use, is the best adapted to the purpose, or is really efficient in the work for which it was created, the public should determine from proper trial, and thus know the value and comparative merits of each. The natural outcome will be the final ascertainment and adoption of the best. The essential qualities are those which surely detect the presence and amount of gas, together with good light, safe and easy handling, cleanliness, etc. Intricacy of design and construction, showing the highest mechanical skill, are not objectionable when producing an instrument that is safe, and simple in its operation.

There is no reason whatever why mines, in which gas is met, should not be worked in the State of Kentucky just as well as similar mines are worked, not alone in various parts of the United States, but all over the world.

Why should we fear gas more in Kentucky than they do in other parts of the world? Why should we not be able to manage it as well as elsewhere? Why should we abandon good mines in this State for a reason for which they would not be abandoned in other States?

If these mines were located in Pennsylvania or other coal producing States they would not remain idle for one day for that reason, but, to the contrary, the necessary ventilation would be established, as well as other well known safeguards, and safety lamps would be introduced so as to avert possible accidents which might be caused by fire-damp.

Machinery adapted for the supplying of large quantities of air for the proper ventilation of mines exists and is thoroughly understood, and the management of a mine need not fear that it can not supply any quantity of air that may be required for the proper working of a mine. In the field of safety lamps, which are required for working in the presence of gas or where gas is to be feared, great advancement and improvements have also been introduced since Sir Humphrey Davy first constructed the lamp known by his name for use in gaseous coal mines. Many inventors have brought about numerous changes so as to improve and increase the advantages of the original Davy lamp, so that the miner's safety lamp of to-day is no longer the simple and incomplete lamp it originally was.

I am indebted to Mr. P. J. Oettinger for most of the facts brought out in the remainder of this article relative to the Wolf safety lamp. They are not published as an advertisement, but merely to give the public a better knowledge of the invention from the standpoint of the inventor, and of its merits as demonstrated by years of use in numbers of the most gaseous mines in both Europe and America.

During the last few years a safety lamp known as the Wolf Safety lamp has been introduced into the United States and has found great favor not alone in the anthracite and bituminous regions of Pennsylvania, but in all parts of the United States and Europe, there being at the present time one-half million of these lamps in daily use in different parts of the world.

Government commissions in various countries of Europe, after having thoroughly tested them, earnestly recommended their introduction and use in gaseous coal mines, on account of the various advantages which this lamp possesses.

Among the advantages claimed for them are the following:

They are three times as sensitive to gas as the Davy safety lamp.

They are extinguished by explosive gas mixtures, with much more certainty than any other lamp, and are therefore safer in the hands of ignorant or inexperienced miners for that reason.



They have been repeatedly tested in a 9 per cent. gas mixture having a velocity of 59 feet per second, and have always withstood this most dangerous percentage of gas with this great velocity without exploding the gas on the outside of the lamp.

They can not be tampered with by the miner as they can only be locked or unlocked by means of a very strong magnet, that is too heavy and cumbersome for the miner to carry about with him in the mine, and it therefore can not be opened by the miner either maliciously or through ignorance, which appears to me a very important safeguard when we consider how many accidents have occurred because the miner could open his safety lamp in the presence of gas.

The locked lamp can be relighted between forty and fifty times, without opening the lamp, it being supplied with an igniter containing a wax tape, which only requires a little pull to light the taper, which is then presented to the wick for the purpose of lighting it by a slight upward push; the whole being very simple in its working.

These lamps give twice as much light as any other safety lamp, burning oil. The wick in the Wolf lamp does not char and need only be renewed every few months.

The light remains practically the same during a 12 hour shift, and requires neither picking or cleaning, as it gives 1.3 candle power at the beginning of the shift and 1.1 candle power at the end of a 12 hour shift, while the best oil safety lamps only give from 0.5 to 0.6 candle power at the beginning of the shift.

The Wolf lamp burns 70 degree deodorized naphtha which costs about 1.3 to  $\frac{1}{4}$  the price of good burning oil, although giving twice the candle power of oil.

Before the European governments permitted the use of naphtha as a burning fluid in safety lamps, they appointed commissions for the purpose of thoroughly testing its safety, and some of the members appointed to these commissions were opposed to the use of naphtha before the tests were made, but the results of their tests were such that they not only declared it safe to use



naphtha, as used in the Wolf lamps, but also recommended the use of these lamps in gaseous mines, so that now, as I have already stated above, there are over 500,000 of these lamps in use in various parts of the world.

The inventor of the Wolf lamp also constructed an automatic filler so as to prevent the spilling and overflow of naphtha during the filling of the lamp; in fact all kinds of precautions and contrivances were successfully devised to make the handling and use of naphtha safe, and from all these there has resulted the production of a safety contrivance for the use of coal miners in gaseous mines, which is unequalled by any other safety lamp of which I know. I might also mention that this lamp has been awarded the gold medal at the Paris Exhibition of 1900.

There are many other safety lamps known to the practical miner, but I have made especial mention of the Wolf miner's safety lamps so fully, because it appears to me to be the most complete device and most advanced up-to-date miner's safety lamp of which I have any knowledge, and I would very much like to see the neglected gaseous coal beds fully worked and developed, and therefore endeavor in this manner to draw the attention of owners of such coal fields, to the existence of such safety devices as will, in my opinion, increase the safety of such workings.

It is natural and self evident that the simple purchase and acquisition of safety devices would not make a mine safe, but these devices must be handled in the proper manner, and with necessary care, that they are always in the best condition to furnish the advantages which they offer, and I feel satisfied that if this matter is taken in hand, in the manner in which it should, it will certainly lead to the result that properties, which are now idle and nonproductive, will soon become producers and profitable to their owners. I trust for this reason that my suggestions will be well considered and acted upon, so that the values of these great coal veins may not be lost to public use."

This lamp was invented, in 1883, by Mr. Carl Wolf, of Zuickauin,

Germany, and was first used in the mines of that country. Since then many improvements have been added, until the climax of perfection seems to have been reached, and its employment has been extended beyond Saxony to all the coal mining districts of Germany, Austro-Hungary, Poland, Russia, and to many districts in Belgium, England and the United States.

This lamp was first introduced into the coal mines of this country, in the early part of 1895, by the Pennsylvania Railroad Company, at its several mines located at Nanticoke, Lykens, and Williamstown, Pa. Since that date, numerous other prominent companies, in Pennsylvania and in other States, have adopted and used the same with perfect success. Among the many other anthracite mines of Pennsylvania where they have been successfully used, I mention the Luke Fidler, and the Cameron collieries, at Shamokin; the several mines of the Lehigh Valley Coal Co., at Wilkesbarre; of the Temple Iron Co., at Wyoming; of the Philadelphia & Reading Coal & Iron Co., at Ashland and Girardsville; and of the Plymouth Coal Co., at Plymouth.

The lamp was not used in the bituminous mines of that State until about April 1899, because the law did not permit the use of explosive oils in those mines, but after the superior merit and success of the lamp had been so thoroughly demonstrated in the anthracite mines, there arose, among the inspectors, operators and miners of the bituminous districts, a general demand for an amendment to the law permitting its use in those districts also, and the legislature of that State thereupon made the necessary amendment, since which time numerous bituminous companies have introduced the lamp with the most satisfactory results. Among said companies, I mention the H. C. Frick Co., that operates large mines at Lewisburg, Bute and Monarch; the Rochester & Pittsburgh Coal & Iron Co., at Eleanora; and the American Steel & Wire Co., at Baggaly and McClellandtown. It has also been introduced with like success in various mines in Colorado, Utah, Wyoming, Indian Territory, Tennessee and West Virginia.

As a safe precaution against unsatisfactory experiment, par-



ties desiring to introduce the lamp can, before doing so, correspond with any or all of the above named companies.

"The excellence of construction, both as regards material used as well as workmanship, makes the Wolf a very strong one, which requires less repairs than other lamps, and, in addition, all parts being carefully made, are interchangeable, and can, when necessary be more easily repaired than other lamps. The original cost of the Wolf lamp is higher than the general run of safety lamps, being \$4 each; but, as the cost of running them is so much less than with other lamps, the expenses for wick being less, the burning fluid naphtha, although giving twice the light, only costs from 1-3 to  $\frac{1}{4}$  that of oil, and about the same quantity of each is used in a 12 hour shift.

Test runs lasting from six months to one year with hundreds of Wolf lamps, both in this country and Europe, have shown the same results, namely that the cost per lamp per 12 hour shift for fuel, wick, reserve parts, etc., are about  $\frac{3}{4}$  cents, and that the cost for labor in cleaning, etc. is 1 cent. per shift, making a total of  $1\frac{3}{4}$  cents per lamp per 12 hour shift, which is much less than the cost of running other kinds of safety lamps, so that the saving causes the Wolf lamp to soon pay for itself, and therefore makes it not alone the safest and best, but also the cheapest lamp.

The wick in the Wolf lamp is adjusted by the lampman in the lamproom before being handed to the miner, in such a manner that the flame will not smoke or soot, and as the miner can not tamper with the wick, on account of his not being able to open the magnetic lock with which the lamp is locked, he can not alter the wick which has been adjusted for him, and which produces a flame of nearly the same light from beginning to end of a 12 hour shift without any picking whatever, and as this properly adjusted flame does not smoke it consequently does not produce soot, and as the combustion in the lamp is complete it gives off only the products of combustion without any odors or anything else which would make the mine air bad or impure."



## NOTES ON THE MINES AND MINE INSPECTIONS.

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This chapter is devoted to detailed statistics connected with the various mines that are omitted from other parts of this annual report, and contains some notes on the condition of the mines, as found to exist at the times they were inspected or visited. It is not intended to include the substance of the inspection notices, as sent to the operators, as fully as heretofore. I am convinced that the continued publication of such routine matter is unprofitable and of no special interest to the public, but enough of them will be included to clearly indicate the character of the inspections made, and demonstrate their value towards bringing about and maintaining safe and healthful mine conditions.

All the commercial mines in the State, with two or three unimportant exceptions, were inspected or visited three times during the year as required by the State mining law, and a number of them oftener. In a few instances, on the general rounds of examination, the mines were not visited, or were visited and not inspected, because ascertained at the time to be wholly useless or impracticable, but such cases as these occur annually. In order to complete the last round, a few mines were inspected during the first half of January of the present year, which, however, made no material difference in time or in the effects of the same. They have all been duly credited to the required work of the office for 1900, and will not lessen its work to any extent for the present year.

During the year a few complaints, as to the conditions of certain mines, were filed in the office and special examinations were asked. These were invariably and promptly made, and all discovered defects were remedied as speedily as possible. The

majority of these complaints related to the mine ventilation, but some of them to other matters connected with the mines, or their operations, and, as usual, some were found to be without justification. As a rule, when there is good ventilation there are no complaints from the employes. They will bear long as to other matters, but when the air is shut off the kick comes all along the line, and for which they should not be blamed, but rather commended.

In many cases we find that the mine boss, or under-ground superintendent, is not allowed a fair chance to demonstrate his ability to properly ventilate his mine. He is either kept too busy at other matters, or is not allowed the time, labor or means necessary to construct good air-courses, or create appliances of sufficient power to conduct the air. In their haste to get coal, needed repairs are overlooked or postponed until there shall come a slack in business. The motto seems to be: "Get coal when you can, and make repairs when you can do nothing else;" whereas such action should be directly reversed, as the first thing to do in all mines is to see that mining conditions, in all respects, are made and kept reasonably safe and comfortable, so that their protection and benefits may be enjoyed while the production of coal is going on. Where is the philosophy, or good business sense, in exposing employes to dangers and discomforts for a day, week or month and then spend \$10.00, \$50.00 or \$100.00 to remedy them? Why not dissipate the evils at the start, or as they shall make their appearance, and have them out of the way all the time?

One notable instance of neglect, on the part of the mine officials, is called to mind where a special inspection was demanded and made, and where working rooms were found 300 feet deep without a break-through, and of course the workmen in them had no air. The excuse was: "We had to get coal while we had orders," but the plea went out on demurrer as insufficient. All these restricted mine bosses should be set free and furnished with the authority and the means to create and maintain good mine conditions, as the first and paramount objects to be attained. This



policy strictly carried out will continually benefit both operators and miners, shut off complaints and costly law suits and save the State much expense.

It is well also to note that mine conditions are always changing, so that good ones to-day become bad to-morrow or next week, unless prevented by a vigilant superintendent. There must always be both the necessary appliances and their full operation, else bad results will certainly follow, and the lack of either will prove to be as ineffectual and unsatisfactory as the absence of both. These comments taken from my 1899 report are still applicable: "In order to maintain safe and healthful conditions, there must not only be proper mine construction and all appliances and facilities to carry out the legal regulations for the government of mine operators, but there must be a rigid application of the latter, else they will be of no value whatever. A pump out of order is the same as no pump, and an air-course without a fan in motion, or a fire in the furnace, or with a brattice down, or with a break-through left open that ought to be stopped, will never supply fresh air to the mine. It is quite clear that good conditions can not be preserved except by carrying forward these regulations as the work shall progress, according to the necessities of each day."

Much the greater part of the field work of the year was done by Mr. C. W. Logan, Assistant Inspector, who continues to demonstrate most admirably his capacity and general fitness for the position. In this connection it is proper to say that an intelligent and faithful execution of the office work of this department leaves but little time on the part of the Chief Inspector for mine examinations, but in addition to the performance of his numerous and fast growing office duties, he was enabled during the year to do considerable field service, as about 80 of the mine inspections were made by him in person.

The custom of dividing the State into three districts is found convenient for this chapter, and is retained. Each district will



be considered separately, and the counties therein taken in alphabetical order.

### NORTHEASTERN DISTRICT.

This district is composed of the following producing counties: Boyd, Breathitt, Carter, Jones, Johnson, Lawrence and Lee. Contiguous counties will be added whenever commercial mines shall be developed in them. The tonnage of the district each year since 1893 is as follows:

YEAR	TONS
1894 . . . . .	351,425
1895 . . . . .	383,779
1896 . . . . .	324,481
1897 . . . . .	393,051
1898 . . . . .	347,168
1899 . . . . .	408,851
1900 . . . . .	482,748

All the mine inspections in this district, except the second and third ones in the counties of Breathitt and Lee, were made by the Assistant Inspector.

The production of the mines is reduced to tons of 2,000 pounds, and in the following tables comparisons are made with the output of 1899. The tables in general include the average working force, and the number of days, of ten hours each, worked at the various mines. In some cases full data could not be obtained, or was not furnished the office.

### BOYD COUNTY.

There are three producing mines in this county: Rush No. 6 and Clinton No. 8, both owned by the Ashland Coal & Iron Co., though the latter is operated by John Wurts, as lessee, and the other one by E. W. Strack. The officers of the above named company are as follows: Col. Douglas Putnam, president and general manager; Robert Peoples, secretary and treasurer; D. G. Putnam,

superintendent; and James Heron, superintendent of the mines. The general office of the company is at Ashland, Ky.

The tonnage and other statistics of these mines are as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Rush No. 6 . . . . .	107,861	117	252	78,961
Clinton No. 8 . . . . .	50,050	82	218	62,349
E. W. Strack . . . . .	1,510	44	263	24,393
Total . . . . .	159,421			165,703

Gain over 1899, 6,282 tons.

All the mines have transportation over the Ashland Coal & Iron railroad and the Chesapeake & Ohio railroad by connection at Denton.

No. 6 mine is at Rush.

No. 8 mine is at Clinton, and the post office address of its operator, John Wurts, is Ashland.

E. W. Strack's mine is near Princess, and his post office address is also at Ashland.

### INSPECTIONS.

No. 6 mine was inspected March 29th, July 6th, and October 20th. Operations were confined mainly to drawing pillars and stumps, and the conditions of the mine were in general quite satisfactory. John Mayberry is the mine boss. This mine has mechanical haulage by compressed air, the engine running over a 35 to 60 pound rail track two miles long, and which does the work of 25 mules. But the mine is nearly exhausted, and this haulage will soon be discontinued.

No. 8 mine was inspected on March 31st, July 9th, and October 18th. Some repairs were necessary on the furnace, at the last

named date, in order to better the ventilation. Conditions otherwise satisfactory.

Princess mine, inspected March 31st, July 9th, and October 17th. Ventilation not sufficient, and some repairs on the furnace and an addition of 16 feet to furnace stack were recommended in order to improve the same.

#### **BREATHITT COUNTY.**

There is but one commercial mine in this county, the one at Jackson, operated during the first of the year by Dudley, Shelby & Co., and during the last of the year by R. T. Davis. Its output for the year was 16,416 tons, as compared to 15,700 tons produced in 1899. The mine has transportation over the Lexington & Eastern railroad.

The mine received the three inspections required by law. The first was in the old mine which has since been abandoned; the second was but little more than a visit shortly after work on the new drift was commenced, as further examination was not necessary. At the time of last inspection there was far too much water and mud on the entries, and better drainage was required.

#### **CARTER COUNTY.**

This county made a marked gain in production over 1899, and on the triple basis of tonnage, number of employes, and accidents has the distinction of being the banner county in the State for the year, and on the same basis it has within its borders the banner mine of the year, No. 10 of the Ashland Coal & Iron Co. Its production of 105,733 tons, by an average working force of 167½ men, engaged for 227 days, without an accident to any of its employes, entitles it to first place. Mr. James Heron is the superintendent of the mine, and Mr. John Skene is the mine boss, and they should be given most of the honors for gaining this distinction. The mines in this county have transportation over the line of the Chesapeake & Ohio Railroad Co.



Grant mine, the No. 7 of the Ashland Coal & Iron Railway Co., for years the largest producer in the county, was exhausted during the summer, but the new mine, No. 10, has more than supplied the loss.

The production, etc., of the mines for the year is as follows:

MINES.	1899.	1900		
	Tons	Av. Em.	Days	Tons
Grant . . . . .	88,117	70	150	81,544
Boghead . . . . .	5,278	58	214	7,815
Star Furnace . . . . .	2,265	. .	. .	. .
Strait Creek . . . . .	48,872	49	290	48,197
Willard or Lost Creek . . .	4,216	87	298	18,242
Meadow Branch . . . . .	4,339	9	. .	4,293
No. 10 . . . . .	18,047	167	227	105,733
Totals . . . . .	166,129			215,824

Gain over 1899, 49,695 tons.

### INSPECTIONS.

Grant mine No. 7, inspected March 30th, but was worked out and abandoned before the second round was made.

### BOGHEAD MINE.

Near Grayson.

P. O. , Grayson.

Operated by the Kentucky Cannel Coal Co.: W. T. Grant, president; B. M. Allison, secretary and treasurer; I. P. Shelby, contractor; James Pettrey, mine foreman.

Inspections were made in March, July and October, and conditions in the mine were good.

Star Furnace mine was idle all the year and has been permanently abandoned.

## STRAIT CREEK MINE.

This mine is located near Denton, and is operated by the Strait Creek Coal Co. P. O., Mt. Sterling, Ky. The company officials are: M. M. Cassidy, president; W. T. Tibbs, secretary; Kent Pritchard, general superintendent. Robert Stamper is the mine boss.

Inspected March 24th, July 16th, and October 22d. All necessary mine conditions found to be reasonably good.

## LOST CREEK MINE.

This mine is located near Willard, and is operated by the Eastern Kentucky Railway Co., with general office at Riverton, Ky.

This mine is a new one, and was formally inspected on October 22d. Furnace was nearly completed.

## MEADOW BRANCH MINE.

This mine is located near Rush, and during the first of the year was operated by G. W. Burton & Co., but since then, and at the present, by the Adkins Coal Co. P. O., Mt. Sterling, Ky. J. F. Vansant is president of the company; J. W. Graves, secretary and treasurer; G. H. Strother, general superintendent. J. P. Strother is mine boss.

The mine was inspected in March, and on July 10th and October 19th. Some fault was found with the ventilation, and instructions were given to the foreman to improve the same without delay.

## NO. 10 MINE.

This mine is located at Rush, and is operated by the Ashland Coal & Iron Co. It was inspected March 30th, July 10th, and on October 19th. Some defects in the ventilation were discovered, and the building of a new furnace was recommended. This mine

bids fair to become the most productive one ever opened by this company. A new tippie and a new incline were built and put into operation by July 20th of last year, and a compressed air mining machine plant and six mining machines were installed during the year; 1 Harrison, 2 Sullivan and 3 Ingersoll Sergeant. The mine as yet has no mechanical haulage.

### JOHNSON COUNTY.

The production of this county was principally cannel and the product of two mines, the Whitehouse and Greasy Creek.

The Whitehouse mine is practically exhausted. It was opened in 1886 and has been operated by the Whitehouse Cannel Coal Co.: Dr. Harry A. Wood, president; F. D. Wallace, secretary; Jay H. Northup, general superintendent. Post office, Louisa, Ky. George Bickford is mine boss.

The Greasy Creek mine is operated by the Greasy Creek Cannel Coal & Tramway Co.: J. S. Rittenhouse, manager. Post office, Eliza.

Both mines were duly inspected on April 3d, July 12th and October 25th.

The year's output is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Whitehouse . . . . .	4,813	80	257	3,872
Greasy Creek . . . . .	6,951	66	. .	11,762
Totals . . . . .	11,764			15,634

Gain over 1889, 3,870 tons.



## LAWRENCE COUNTY.

The production of this county was confined to two counties, as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Peach Orchard. . . . .	46,846	91	194	54,539
Torchlight. . . . .	2,572	26	..	1,027
Totals . . . . .	49,418			55,566

Gain over 1899, 6,148 tons.

## PEACH ORCHARD MINES.

These mines are located at Peach Orchard and are operated by the Peach Orchard Coal Co.: John C. Welty, president; H. P. Scott, secretary and treasurer, and A. A. Branch, general manager.

The Torchlight mine is located near Walbridge, and is the one operated by J. X. Hill in 1899, but at present is operated by Col. Jay H. Northup. Post office, Louisa. Isaac Hall is mine boss.

The Peach Orchard mines were duly inspected on April 2d, July 11th and October 24th. The Elizabeth mine is practically worked out and a new drift has been opened in the hill south of the Annie mine.

Annie mine, inspected April 2d. Face of tenth right entry 225 feet ahead of air, and entries in many places too sloppy.

July 11th: "Ventilation reasonably good. Main entry door, near tenth right, needs repairing. Drainage satisfactory, except on tenth right entry, where some well directed corduroying must be done. Props are carefully attended to, and no immediate neglect to properly timber observed, excepting a very dangerous slab of slate on seventh left entry which was directed pulled."

October 24th: "Drainage much improved on main entry road-

way. No neglect to prop rooms or timber entries observed. Furnace has ample draught power, but owing to preparations being made for the immediate installation of a mechanical haulage on main entry, several break-throughs need bratticing, and doors hung where indicated to mine boss, to properly conduct the air-current nearer face of main and into eleventh left entries, which are quite smoky."

The Torchlight mine was inspected on October 26th, and conditions were found to be good; however, as only five men were working inside, it was not subject to the State law, but no doubt this year the force will be increased.

#### LEE COUNTY.

The tonnage of this county is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
McGuire . . . . .	5764	16	209	7,034
Norman . . . . .	..	26	225	6,570
Brandenburg . . . . .	1183	..	..	..
Totals . . . . .	6947			13,604

Gain over 1899, 6,657 tons.

Both mines are located near Beattyville and near to the Kentucky river, and each received three inspections or visits during the year.

The McGuire mine is operated by the McGuire Coal Co.: Walker Jameson, president, and Logan Thomas, secretary and treasurer.

The Norman, or White Ash mine, is operated by Maj. L. C. Norman & Sons, who have a general office at Lexington.

A recent analysis of a sample of coal from this mine by Prof. Alfred M. Peter, State Chemist, in connection with his general

work in the Kentucky Experiment Station, at Lexington, shows it to be of excellent quality, and sustains the well earned reputation of the Beattyville coals on the general markets, where it has been sold for a number of years. The analysis is as follows:

Lexington, Ky., Feb. 18, 1901.

Coal sent by L. C. Norman & Sons, February 9, 1901. Analysis of the air dried coal:

	Per cent.
Moisture . . . . .	2.94
Volatile combustible matters . . . . .	29.88
Fixed carbon . . . . .	54.03
White ash . . . . .	3.65
	<hr/> 100.00
Sulphur . . . . .	1.25
Coke . . . . .	57.68

ALFRED M. PETER, Chemist.

#### SOUTHEASTERN DISTRICT.

This coal producing district is composed of the following counties: Bell, Knox, Laurel, Pulaski and Whitley. Other counties are embraced in the territory, but for lack of transportation facilities contain no commercial mines. The production of the district, for several years past, has been as follows:

Year.	Tons.
1894 . . . . .	798,804
1895 . . . . .	1,039,712
1896 . . . . .	1,096,585
1897 . . . . .	796,430
1898 . . . . .	1,123,892
1899 . . . . .	1,355,878
1900 . . . . .	1,604,432



**BELL COUNTY.**

The production of this county was made at the following mines:

MINES.	1899.	1900.		
	Tons	Av. Em.	Days	Tons
Pineville .....	47,546	209	271	70,915
Straight Creek .....	40,764	400	216	95,607
Bennett's Fork .....	14,599	21	201	12,541
Excelsior .....	16,637	49	218	25,178
Tuckahoe .....	329	...	...	713
Mary Hull .....	12,799	...	...	.....
Totals .....	132,674	...	...	204,954

Gain over 1899, 72,280 tons.

The mines in this county have transportation over the Cumberland Valley division of the Louisville & Nashville railroad.

All the inspections were made by C. W. Logan, Assistant Inspector.

**WEST PINEVILLE MINES.**

These mines are located near Pineville, and are operated by the Pineville Coal Co., with offices both in Pineville and Middlesboro. Robert Holmyard is general manager.

This mine has an electric plant for mining the coal and to carry on the mine haulage. It was installed in 1897, and its use has been satisfactory to the company. The haulage is conducted by a six ton motor over a track 2,500 feet long. Most of the product was marketed in Louisville and at intermediate points in the State; but about 15 per cent. of it was sold out of the State.

Inspections were made April 13th, August 1st, and November 23d.

Mine No. 1, April: Drainage was reasonably fair, but the venti-

lation was inadequate. The furnace power was exhausted to a certain extent by the direct intake of air from the third right entry. Peremptory instructions were given the mine officials to remedy this. The curtains generally were in very bad condition, and the air intended for head works was lost by leakage. Secure brattices must be put up at once where indicated to the bank boss, and the connection from second to third left entries must be rushed through narrow, as quickly as possible, for the fall in the air-way permits very little, if any, air-current to pass above third left entry. I positively insist that this receive your active attention immediately."

Mine No. 2: "Owing to a gradual ascending of the coal near head of sixth left entry, it was deemed expedient to make permanent the air intake way on fourth left, consequently a ditch capable of draining this entry is being rapidly made. With this done the inconvenience occasioned by the water rising to such a height as to prevent the proper volume of air entering the mine will also be improved."

August—Mine No. 1: "Connection from second to third left entries not quite made (but will likely be completed before this report is received). With this done and fifth left bratticed up below sixth left door, air current traversing head entries will be strengthened. Mine was idle at time of inspection, and proper determination of ventilation not obtainable; however, much improvement in doors, brattices, etc., was observed since last supervision, which was quite gratifying to the inspector. Other conditions not bad."

Mine No. 2: "Owing to the small number of persons (46) working in this mine, ventilation is not very bad, but with 6½ entry driven to the outside, as will be done at once, and utilized as an intake air-way, as discussed with the mine boss, adequate ventilation for as many persons as would likely be employed in this mine will result. Conditions otherwise fairly good."

November 23d, Mine No. 1: "Excepting furnace needed reno-



vating and some curtains repaired, all essential conditions were fairly good."

Mine No. 2: "No immediate neglect to post rooms or timber entries observed. Drainage reasonably fair, but will be good when water way is completed, that is nearing completion.

"Ventilating current traversing the mine is insufficient to properly ventilate the 100 under-ground workmen. Especially so is the air-current on fourth and fifth right entries inadequate. As discussed with Mr. Holmyard, general manager, a furnace constructed on fourth right entry, so soon as it is driven to outside, I believe would obtain a higher standard of ventilation than ever heretofore afforded this mine, and it is suggested that this entry be driven steadily with this end in view; however, to cause an immediate air betterment, the following instructions must be complied with: The number of diggers on fifth right be reduced; the room necks be securely bratticed, and the air-way from fourth to fifth right entries be cleaned out. It is essential to increase the furnace draught power, and to do so, it is necessary to obviate, as much as possible, all leakages from door near mine mouth and all brattices along main entry, which to a very great extent attract much of the draught capacity of the furnace, peculiarly located as it is.

"The sectional area of intake entry must be enlarged, as instructed bank boss, and many other minor improvements were suggested same official, which materially affect ventilation. I trust this matter will receive your active, immediate attention, and refer you to Section 10 of the Mining Law."

All the above comments are taken from the inspection notices as prepared by Mr. Logan and sent to the Pineville Coal Co.

#### STRAIGHT CREEK MINE.

This mine is located at Straight Creek, and is operated by the National Coal & Iron Co., with main office at Louisville, Ky., in the Louisville Trust Company's Building. The company officials are: Theodore Harris, president; M. S. Barker, vice president;



Sam H. Stone, secretary; and F. D. Clifford, superintendent. Lee Sexton is the mine foreman.

This mine has taken first place in this county in tonnage and working force, and supports a coking plant that made a production during the year of 32,127 tons, the second in amount in the whole State. It has undeveloped coal lands in reserve sufficient to continue its business for generations to come, and its rapid enlargement from year to year is anticipated, and will naturally follow such auspicious beginnings. About half its product was marketed in the cities of Nashville, Tennessee, and Chicago, Illinois, and the other half in Louisville and other Kentucky cities. There was a suspension in work, from the 1st to the 15th of September, pending the adoption of a wage scale, the old one having expired on September 1st.

Inspections were made on April 14th, August 2nd, and November 24th.

April: "Conditions generally good, but some entries were too sloppy."

August: "Ventilation inadequate, but the superintendent was driving the second West entry night and day towards the outside (about 200 feet to go) with the intention of constructing a fan on the same, which it was thought would give the mine good air."

November: "Ventilation still inadequate. The place for the new fan changed to third East entry, which was being driven to the outside. This change for good reasons was approved, and when carried out will make the ventilation excellent."

#### BENNETT'S FORK MINE.

This mine is operated by the Bennett's Fork Coal & Coke Co., with its office in Middlesboro. M. H. Rhorer, president; George Luke, secretary and treasurer; and H. D. Drummond, general manager.

The whole product of the mine is marketed outside of the State, mainly in Atlanta and other cities of Georgia, and in Knoxville, Tennessee.

Inspections were made on April 16th, August 3rd, and November 26th, and the mine each time found in fair condition. Some minor defects were noted and ordered corrected.

#### EXCELSIOR MINE.

This mine is at Excelsior, and is operated by the Excelsior Coal Mining Co., W. B. Hughes, president; W. F. Nicholson, secretary and treasurer; and S. C. Fisher, general manager.

There was a strike among the employes during all of September over a demand for an increase in wages. Some increase was granted and mining was resumed October 1st. All the product was sold in this State. The vein worked is five feet thick.

The mine was inspected April 17th, August 4th, and November 27th, and conditions in the main were found as follows:

April: "Conditions generally good, but a small hindrance to the ventilation was noted, and orders were given to make a ditch on main entry deeper that better drainage might be provided."

August: Ventilation was not good, and the fire basket was condemned as insufficient, and a furnace was ordered built as soon as a certain favorable point could be reached with the main entry.

November: Conditions as to ventilation and drainage still bad, although the main entry had been driven to the outside. The management was notified that these conditions were in open violation of the State mining law, and would not be endured by the office, and twenty days were allowed to remedy all the defects.

#### TUCKEHOE MINE.

This mine is at Four Mile, and is operated by the Tuckehoe Coal Co.; John Collins, president; E. L. Shell, vice president and general manager; and Charles F. Sullivan, secretary and treasurer. Main office at Dayton, Ohio.

Extensive and costly preparations were made during the year for large operations in the future, including an electric mining plant, a fuller description of all which is given in the chapter on



"Mine Improvements." No coal was produced until in November. Inspections were not necessary and not made.

### KNOX COUNTY.

The mines of this county have transportation over the Cumberland Valley division of the Louisville & Nashville railroad. All inspections were made by Mr. Logan, Assistant Inspector. The output of the several mines is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
North Jellico .....	202,341	267	271	217,987
East Jellico .....	22,360	96	273	46,457
Ross Jellico .....	1,090	...	...	18,428
Gray's .....	16,530	...	...	14,554
Artemus .....	1,429	...	...	11,572
Hemphill .....	340	...	...	.....
Knox Gem .....	.....	...	...	2,700
Totals .....	244,090	...	...	311,698

Gain over 1899, 67,608 tons.

### NORTH JELICO MINE.

This mine is at Bertha, about two miles from the main line of railroad at Gray. There are two openings to the mine, one each in opposite hills that have separate means of ventilation, but the coal from each is loaded at the same tippie.

It has the distinction of producing the largest yearly tonnage ever reached by a Kentucky mine. This was in 1898, when its output was 237,400 tons. Since then it has dropped back to second place, giving way to No. 9 mine, at Earlington, in 1899, and to Reinecke mine, at Madisonville, in 1900. During the year just



closed there was no suspension of work from any cause, but constant harmony between the company and its employes. The product was mostly marketed in Louisville, though some of it was sold in other cities and towns of this State, and 20 per cent. of it was disposed of in other States.

The whole mine is splendidly equipped with modern machinery and appliances for rapid production, and is doing excellent work. The vein worked is the Jellico, and is 46 inches thick. Thirty-seven mining machines are in use, operated by compressed air, and 98 per cent. of the year's output was mined in this way. The mining town has a class of dwellings far above the average, and are quite neat and attractive in appearance, and an elegant church house of modern construction is located in convenient reach of all, and everything in sight has the general appearance of contented thrift and permanency. Altogether, North Jellico is a great enterprise, and highly creditable to the company that has planted and maintained it, and I predict for it still greater prosperity for many years to come.

The mine is owned and operated by the North Jellico Coal Co., J. B. Speed, president; I. P. Barnard, vice president; W. A. Jones, secretary and treasurer; and C. S. Nield, general manager. Alexander Frost is the superintendent of the mine.

Inspections were made April 18th, July 30th, and November 20th.

April, No. 4: Conditions generally good.

No. 5: Some fault was found to the drainage, and a furnace was recommended on sixth left entry, but air was good for the number of employes then in the mine.

July, No. 4: Two doors were needed on main entry, above first and second left entries, to cause the air-currents to traverse these. Otherwise the ventilation was good.

No. 5: Ventilation inadequate. The furnace was deficient in power, because of the long and circuitous route between it and the place of intake. Positive notice was given that improvement must be made, and assurances were given that a new furnace

would be built on the 6th right entry, and the same be utilized as a new intake.

November, No. 4: General conditions good.

No. 5: Ventilation still defective, the new furnace not having been built, and warnings were given the company that it must be built at once, and good air provided for the mine, else the matter would be taken to the courts.

#### EAST JELICO MINE.

This mine is located at Coalport, and it is well equipped with a compressed air mining machine plant, and mechanical haulage. The present opening was made in 1895, and will probably last for twenty years before another shall be necessary. Practically all the product is marketed in Kentucky cities and towns. There was a strike among the employes from June 2nd to June 14th, caused by a demand on the company that the organization as such be recognized, but work was resumed without such recognition being made. The coal vein worked is known as the Dean and is seven feet thick.

The mine is operated by the East Jellico Coal Co.: S. Taylor Sheaffer, president; R. G. Yingling, vice president; F. G. Tice, secretary; J. M. Shannon, treasurer; and J. B. Hanford, superintendent.

Inspections were made April 12th, August 6th, and November 26th.

I quote from the report of Mr. Logan as follows: "The air volume passing into this mine, to ventilate the 55 under-ground employes, is entirely insufficient. The present furnace is inadequate. Necessary brattices, etc., have been neglected to a certain extent, and the proper conduction of air to working faces can be obtained only by systematic bratticing. The air-ways, without a single exception, contain too much mine refuse. They should be kept open and clear.

"No. 5 entry near head has no ventilation whatever, either arti-



ficial or natural, and the same may be said of fourth entry. Face of No. 5 entry is 125 feet ahead of air, while brattices are needed on No. 4 entry in all room necks on left except head one. With a connection made between these entries, as discussed with Mr. Hanford, air friction could be greatly reduced. This should be done. A fan is strictly necessary. It can be placed at site of present furnace, and utilized as either a force or suction, contingent on atmospheric conditions. With a fan erected, ventilation would be good, I don't doubt.

"Notice was given the company to make all needed improvement on this line within twenty days, or the matter would be taken to the courts. Better mine drainage was also demanded of the company.

August: Top very treacherous, but reasonably well supported both in rooms and on entries. Drainage fairly good; ditch to outside complete and well open. In compliance with former instructions, a fan has been erected which is sending a volume of 34,080 cubic feet of air per minute into the mine, for the seventy persons employed therein. This air volume, when properly distributed, is enough for nearly five times the force then in the mine.

November: A few minor defects were noted, but in general the mine was in good condition.

#### ROSS JELICO MINE.

This mine is located near Gray, and is operated by Ross Brothers. The yearly blank was not returned, and the name of the mine officials and other matters were not obtained.

Inspected April 12th, July 30th, and November 20th.

Ventilation was quite defective most of the year. A furnace was ordered built in April, but had been delayed from time to time, until in November twenty days under the law were allowed to construct the furnace and make conditions good, else the matter would be taken to the courts.



## GRAY'S MINE.

The old mine known as the West Jellico, and more recently worked in the name of the North Point Jellico Coal Co., was worked out and abandoned during the year. It was inspected in April.

A new mine is now opened some distance from Gray, and is being operated by Mrs. Sarah M. Gray, in the name of the company above set out.

## ARTEMUS MINE.

This mine is located at Artemus, and is operated by the Artemus Coal Co. It was inspected April 12th, July 31st, and November 22d.

Various defects were noted which tended to retard ventilation, and divers instructions were given in order to better it; however, the same was reasonably good in July, and was not bad in November, but needed improvement, and to that end some curtains were ordered to be put up, and twenty feet ordered to be added to the furnace stack.

## KNOX GEM MINE.

This is a new mine opened at Barboursville, a description of which is given in the chapter on "New Mines." It is operated by the Knox Gem Coal Co.: W. G. Freeman, president; B. Moore, secretary and treasurer; and B. R. Hutchcraft, general manager. Richard Attie is mine foreman.

## LAUREL COUNTY.

The mines in this county have transportation over the central Kentucky and Knoxville division of the Louisville & Nashville railroad. While the tonnage of the county was much larger than in 1899, yet it was considerably affected by a general suspension of the mines during September and part of October, pending a settlement of the general wage scale.

All three rounds of inspection in this county were made by Stone, except the mine at Lily was inspected altogether by Logan. He also made one or two special inspections, as will be noted.

The production of the several mines in this county during the year was as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Laurel .....	46,166	91	252	61,362
Star .....	10,426	70	193	25,139
Peacock .....	3,780	...	...	.....
Manchester .....	6,183	38	236	19,996
East Altamont .....	2,964	...	...	.....
Lily .....	16,285	39	169	15,525
Kentucky .....	21,950	61	173	20,857
Altamont .....	18,888	...	...	.....
Daisy .....	2,612	...	...	.....
Swiss .....	5,206	...	...	.....
Standard .....	23,307	64	227	25,221
Old Standard .....	.....	...	...	350
Victoria .....	33,256	88	204	34,795
Pitman .....	62,627	83	223	59,353
Pittsburg .....	39,767	94	208	43,514
Diamond .....	20,878	122	204	55,517
Totals .....	314,294	...	...	361,637

Gain over 1899, 47,343 tons.

It will be noticed that there is a difference of 700 tons in the addition of the tonnage of 1899, as compared to the addition in the 1899 report, also in another part of this report. This also

affects the amount of tons gain, by the same amount. The correct addition makes 314,294 tons, or 700 tons less than the one made in the 1899 report.

Extensive preparations are being made for the development of a large coal territory in this county, heretofore wholly untouched, lying about three miles east of Pittsburg. Already a branch railroad is being built by the Louisville & Nashville railroad company connecting this new field with the main line at Pittsburgh, and it will no doubt prove to be an important feeder for the road for many years to come, as the territory to be mined is a large one. I do not know the names of all the companies that have brought about this important enterprise, but the Pitman Coal Co., at Pittsburgh, has been its chief promoter, and probably is more interested in it than any and all others combined. A more extended description of all these improvements is reserved for the report of 1901.

#### VICTORIA MINES.

These mines are located near Pittsburgh, and are operated by the Victoria Coal Co.: Capt. W. A. Pugh, president. The yearly blank sent out was not returned, and the names of all the company officials can not be given.

A complaint reached the office relative to the conditions of the mine late in January, 1900. Mr. Logan went and made the inspection. He found that the complaints were well taken; that much of the mine was too wet and muddy for endurance, and that the air conditions were intolerable. The air volume entering the mine was abundant for the working force in it, but its distribution was so defective as to make the ventilation positively bad. All the defects were noted and pointed out to the company, and prompt and radical repairs were ordered made.

Inspected April 20th. Ventilation good, except on fifth right entry where it was unbearable, and too much mud and water found in several parts of the mine. Twenty days were allowed the company in which to make the necessary improvements.



Inspected again July 28th, and conditions found to be greatly improved. The ventilation on fifth right was good.

Inspected November 21st. Ventilation good, except in the heads of the entries where the air courses were too far behind. Some corduroying and some ditching were found to be necessary. New drift on the left of the road was much too wet and needed drainage.

#### LAUREL MINES.

These mines are located near Pittsburgh, and are operated by the Laurel Coal Co.: George Givens, president; and J. W. Bastin, secretary and general manager. D. W. Roark is superintendent of the mine.

The mine product is nearly all sold in this State, Louisville, Lexington, and Richmond, being the principal markets. No mining was done from August 31st to October 2nd, on account of a demand for an increase in wages. An advance of five cents per ton was granted to the miners, and of  $7\frac{1}{2}$  per cent. to other labor.

Inspected April 19th, July 25th and 26th, and November 21st.

April: Ventilation only fairly good and improvement needed. Some ditching and corduroying also needed.

July: Improvement noted, but better drainage was needed.

November: Conditions very good, in fact quite satisfactory.

#### PITTSBURGH MINES.

These mines are located near Pittsburgh, and were operated during the year by the Pittsburgh Coal Co.: J. D. Smith, president; and W. B. Neal, secretary and treasurer. Since the close of the year I understand that Mr. Smith has died, and that the property, or its management, has passed into the hands of a new company, but these facts properly belong to the report for 1901. Mr. Bryant is mine foreman.

Inspected April 24th, July 26th, and November 14th.

April—Old Mine: All conditions very satisfactory. Some minor repairs were suggested.

New Mine: Ventilation defective. The fire basket was deficient. A furnace was to be built and some ditching was necessary to improve the drainage.

July: Old mine about worked out. Only seven men inside, and no inspection was necessary.

New mine found in good condition in all respects.

November—Old Mine: Air volume good, but not taken well to the head.

New Mine: Ventilation not good, and improvement on furnace must be made.

#### PITMAN MINES.

This mine is at Pittsburgh, and is operated by the Pitman Coal Co.: W. A. Pugh, president; J. M. Bailey, vice president; J. L. Caldwell, secretary; and S. V. Rowland, general manager. W. C. Webb is superintendent of the mine.

The yearly report was not received, and the information therein sought was not obtained.

The mine was inspected in April, July, and November, and, in general, good mine conditions were maintained throughout the year. The entries are kept clear of gob and their passage made easy and safe. The new air-shaft on right entry near head workings makes the ventilation excellent, and altogether the mine has been kept in most excellent condition.

#### STAR MINE.

This mine is operated by Bastin & Prichard, P. O. East Bernstadt.

The mine was idle during all of September and until October 10th, on account of a demand for a higher mining scale for the ensuing year. An increase of  $7\frac{1}{2}$  per cent. was granted to all the

employees, and two pay days per month were also agreed upon. The coal is marketed at various cities in this State.

Inspections were made in April, July, and October.

April: Excepting a few minor defects, as noted at the time, the mine was in a satisfactory condition.

July: The mine was in a very good condition, but an increase of the air volume was recommended. Haulways also needed some improvement.

November: Some corduroying needed on main entry near head, also on Beatty entry. Ventilation deficient at head of Collins entry, and badly deficient on Beatty entry. A cut off was being made from Beatty to Williams entry, which will make the air better; but the furnace is inadequate and too far from the workings, and a new air shaft and furnace must be provided without delay, either near head of Beatty entry or near head of main entry.

#### MANCHESTER MINE.

This mine is operated by the Manchester Coal Co., P. O., East Bernstadt.

The yearly blank was sent, and I can not give the names of the company officials.

During the year the mine on the left side of the railroad was abandoned and a new drift was opened in the hill on the right.

The mine was inspected in April, July, and November.

April: All conditions were quite good.

July—New Mine: The air was weak in the head of the entry, but otherwise the conditions were very good.

November: Ventilation good. I note a new air-shaft near the head, on main entry, where a furnace is to be built.

#### NEW DIAMOND MINE.

This mine is operated by the New Diamond Coal Co.: R. M. Jackson, president; W. H. Kinnaird, vice president; W. S. Sandifer, secretary; H. C. Thompson, general manager. Robert McNeil is mine boss.



This mine was opened in 1891, and it will require about 15 years to exhaust it. Extensive improvements were made during the year, as noted in other parts of this report. Mining was suspended during parts of September and October, pending a settlement of the wage scale. The product is all marketed in Lexington and other Central Kentucky cities and towns.

Inspections were made in April, July and November.

April: The mine was found to be in bad condition generally. Much ditching and corduroying were needed, and entries needed to be cleared of mud and gob, and the air courses needed to be cleaned out. Twenty days were allowed the company to remedy all these defects.

July: The mine was still in bad condition. Numerous defects were pointed out and their abatement ordered, also such repairs as were needed, and the company was duly warned to comply with the directions, else the matter would be taken to the courts.

November: Conditions generally very much improved. I note the near completion of the new air-shaft and Mr. McNeil's promise to have the new fan in operation within 20 days from the date of inspection, November 13th. A ladder way was ordered placed in the new air shaft, to make it a safe place of ingress and egress to the mine. This was made imperative. Some corduroying was needed on main entry, near the head, also some timbering on entries.

#### STANDARD MINE.

This mine is operated by the Standard Coal Co.: S. J. Thompson, president; C. H. Moses, secretary, and J. M. Thompson, general manager. Post office, Viva. J. A. McBrayer is mine boss.

This bank was opened in 1898, and will probably last 10 years. The product is marketed in Louisville and in Central Kentucky points. The vein worked is 3 feet thick. Mining was suspended from September 15th to October 14th. The company granted an increase of 5 cents per ton on mining, and a corresponding increase on day labor.

Inspections were made in April, July and November.

April: Mine was idle and almost drowned out by the heavy rains. Could not go through all the mine. Ventilation also bad. There was an air shaft, but no furnace in it, but a boiler with a fire box in it. This was a makeshift and nuisance, because it was depended on for ventilation, but was wholly inadequate. New furnace was ordered at place where pump is to be placed, and all needed repairs and improvements were ordered to be completed within 30 days from the date of inspection, April 19th.

July: The mine was wholly unfit to work in, because of water, mud and bad air, but the mine boss assured me that he could reach the air shaft and construct a new furnace within 10 days from that date, July 24th, and the company was allowed until August 14th, under penalty of the matter being taken to the courts for a failure to comply with the directions.

November: Conditions very much improved. Ventilation fair, except at head of first and second left entries, which needed remedying. This mine has no second outlet, and another must be provided; however, when the entry and air course, now in progress, are cut entirely through the hill, and connection made near the new furnace, as is contemplated, the outlet will be made. I note the completion of the new furnace.

#### KENTUCKY MINE.

This mine is located near Pittsburgh, and was operated during the early part of the year by Bierach & Phillips, and later by Karl F. Bierach & Bro. Co., under the name of the New Peacock Coal Co. - Late in December the company transferred its interest in the mine to Olmy, Wilkes & Thompson, who have since been operating it.

The mine was inspected in April, July and November, and never found in good order, but always in bad order. Mud, water, gobbled entries, dangerous haulways, lack of air, no sufficient furnace, etc., and what not. It seems like this mine is fated to bad conditions. However, the office is not without hope of making



decided improvement, and of eventually bringing about and maintaining good conditions.

#### LILY MINE.

This mine is at Lily, and until about October 20th, was operated by G. W. Curvin, when Karl F. Bierach & Bro. Co. took charge of the same and has since been working it. Karl F. Bierach is president and treasurer; and Julius E. Bierach is secretary and manager of the new company. Since they have taken charge, they have inaugurated extensive and costly improvements, such as a battery of boilers, a pumping plant and rope haulage, not yet complete, and the installation of a compressed air plant for mining the coal is in contemplation during the coming summer.

Inspected by Logan April 9th, July 28th, and November 21st.

April: Ventilation reasonably fair, but better drainage was badly needed. Directions were given to improve the same.

July: Work was in progress tending to better the mine conditions relative to the ventilation and drainage.

November: Much improvement in haulways, drainage and ventilation, and a fan is to be installed, which will make the air abundant.

#### OLD STANDARD MINE.

This mine was operated a short time by Centers & Cloyd and a small working force, but was then abandoned. It was inspected in July.

#### PULASKI COUNTY.

The mines in this county are located along the line of the Cincinnati, New Orleans and Texas Pacific railroad. Their production during the year was as follows:



MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Alpine .....	7,650	47	169	14,543
Barren Fork .....	67,606	141	220	64,802
Cogar Creek .....	10,478	27	82	2,833
Indian Creek .....	16,555	34	172	15,298
Paris .....	.....	13	97	2,858
Cumberland .....	.....	43	...	2,078
Totals .....	102,289	...	...	102,412

Gain over 1899, 123 tons.

All inspections were made by the Assistant Inspector.

#### ALPINE MINE.

This mine was operated during the first half of the year by J. M. Ramsey, lessee of the Richmond Coal Co. It was then idle until August 15th, when the Alpine Coal Co. took charge of the plant and has ever since been operating it. T. M. McConnell is president of the new company; J. T. Hill is secretary and general manager and A. W. Evans, superintendent. About 25 per cent. of the product is marketed out of the State. Inspections were made May 30th, October 10th, and January 4th, 1901.

#### COGAR CREEK MINE.

This mine was idle during the first half of the year, but operated during the last half by the Cogar Creek Coal Co.: D. S. Anderson, president; and C. H. Mills, secretary and superintendent. S. P. Honeycut is mine foreman. Post office, Flat Rock.

Inspections were made October 10th, and January 5th, 1901.

## PARIS MINE.

This is a new mine opened in August by the Paris Coal Co., which is co-operative in its character. Post office at Parker's Lake.

No coal was run until August, and 2,858 tons were produced by the close of the year. Inspections were made October 10th, and January 5, 1901.

## FLAT ROCK MINE.

This mine is a new one opened in November and operated by the Cumberland Coal Co.: R. A. Williams, president and general manager. Thomas McPherson is mine boss. Post office, Flat Rock.

## INDIAN CREEK MINES.

These mines are operated by J. C. Parker. Post office, Parker's Lake. Most all its product was marketed in this State. No mining in September and part of October. A 12½ per cent. advance in wages was demanded and an advance of 7 per cent. was finally granted.

Inspections were made June 1st, October 10th and January 5th, 1901.

## BARREN FORK MINE.

This mine is located at Barren Fork, and is operated by the Eagle Coal Co.: J. T. Slade, president; C. C. Patterson, secretary; and W. L. Carter, superintendent. J. W. Burris is mine boss.

Most of the product is marketed in Lexington, Danville, Harrodsburg and Lawrenceburg. Some of it is sold in Atlanta, Ga., and Chattanooga, Tenn.

Inspections were made May 30th, October 9th, and January 7th, 1901, and conditions generally throughout the year were found to be quite satisfactory.

**WHITLEY COUNTY.**

All the mines in this county, except Pine Knot and Strunk, are located on the Knoxville division of the Louisville & Nashville railroad. The production of the county for the year is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Whitley .....	41,634	102	281	31,487
Dowlais .....	61,189	142	215	63,154
Mt. Ash .....	71,822	137	209	77,509
Procter .....	106,079	170	264	110,299
Grinstead .....	92,855	160	259	96,699
Strunk .....	31,581	91	174	46,068
Pine Knot .....	19,296	48	164	13,762
Mt. Morgan .....	50,583	140	242	89,964
Kensee .....	86,792	153	232	94,787
Totals .....	561,831	...	...	623,729

Gain over 1899, 61,898 tons.

All inspections of the year were made by C. W. Logan, Assistant Inspector.

**WHITLEY MINES.**

These mines are located at Halsey, about eight miles east of Jellico, and it is operated by the Whitley Coal Co.: John B. Atkinson, president; E. T. Halsey, vice president; S. H. Newbold, secretary, and Thomas R. Evans, superintendent.

Inspections were made April 7th, July 25th and November 17th.

April, Mine No. 3: Only 4 men inside. No. 2 had 12 men inside. No artificial ventilation. The above is for Birdeye.



Vanderpool: A ditch is needed near mouth of the mine. The present furnace is inadequate, and one must be built on left of main entry, as was explained by Mr. Evans.

No. 2 drift: Trap door on main entry was down, and no air was passing through the mine, and the black damp prevented me from reaching the immediate workings. The main entry was much too wet and sloppy.

A very courteous letter was written by Mr. Thomas R. Evans, the superintendent of the mine, in which he acknowledged receipt of the inspection notice, and explained the cause of the temporary bad conditions as found, and showing all proper effort to make necessary corrections. The letter reads as follows:

Halsey, Ky., April 27, 1900.

G. W. Stone, Esq., Inspector of Mines,

C. W. Logan, Esq., Assistant Inspector of Mines,

Dear Sirs: Your report of the last inspection made by Mr. Logan was duly received and carefully read. We will certainly improve the conditions of our mines as fast as we possibly can. We have already ditched the side of track at new Vanderpool No. 3, also old Vanderpool, where it was so very sloppy and wet. Better door was put up on the entry where you saw the old one down. We had a small fire at the air furnace for about 4 days. The pillar between the entry and the furnace took fire and we put double shift to cut it out and haul the red coals and ashes and burnt slate out doors. The furnace wall was too thin and opened for a few days. The fire was intense. Slate and coal burning. We simply cut it out and removed it to slate tip, or rather to the side of the mountain. For the last few days everything seems to be fairly well. That black damp has been diluted, or driven out for the present.

Respectfully,

THOMAS R. EVANS.

July, Birdseye No. 3: This is merely a haulway being cut through the mountain. Conditions in general not bad.

Drift No. 2: Only 5 men inside and conditions are fairly good.

Vanderpool: This mine is nearly exhausted. Only 5 men inside and conditions are fairly good.

Dean Mine: This mine is just being cleaned up after a 3 years' suspension.

November, Birdeye mine: Conditions fair, except at face of main entry the ventilation was defective, caused from leakage in brattices on main entry blind.

Dean mine: Furnace insufficient, and a new one must be provided:

#### DOWLAIS MINES.

These mines, the old and the new, are operated by the East Tennessee Coal Co.. Post office, Jellico, Tenn. The company officials are: E. J. Davis, president; F. C. Richmond, secretary; and W. E. Davis, superintendent. H. C. Goins and D. D. Jenkins are foremen of the mines.

Sixty per cent. of the product is marketed out of the State, in cities and towns of Tennessee, North Carolina and Georgia. Full time was not made for want of men and railroad cars.

The old mine has tailless rope haulage over a track 5,000 feet long inside the mine, which may be increased to 7,000 feet. The plant has given great satisfaction.

Inspections were made April 6th, July 24th and November 13th.

April, Old mine: Ventilation bad. Water on furnace entry is roofed. Directions were given to repair these defects.

New mine: Ventilation just fairly good.

July, Old mine: Much improvement in ventilation and drainage since date of last inspection.

New mine: Ventilation reasonably fair.

November, Old mine: The curtains on room necks on Mallicot entry needs to be taken down and doors put in their place, to produce better circulation on same. Elsewhere the ventilation was satisfactory.



New Mine: A renovation of the furnace is necessary, and new grate bars put in, and ventilation will be good.

#### MOUNTAIN ASH MINES.

These mines are located at Mountain Ash, and are operated by the Jellico Coal Mining Co.: Arthur Groves, president; E. J. Davis, vice president; Howell J. Davis, secretary and treasurer, and J. L. Williams, general manager. Jonathan Jenkins, mine boss.

About one-third of the product was sold outside the State, in cities of Tennessee and the Carolinas.

Inspected April 10th, July 26th, and November 16th.

April: Some minor defects were noted and ordered corrected.

July, No. 4: With several curtains and brattices repaired, as indicated, the ventilation ought to be reasonably good.

No. 3: Ventilation not very good, and corrections ordered to be made.

November 16th: All essential mine conditions were good.

#### MT. MORGAN MINE.

This mine is operated by the Mt. Morgan Coal Co.: J. P. Mahan, president; T. B. Mahan, vice president; S. E. Mahan, secretary; John T. Philips, superintendent. Post office, Williamsburg. George Hunnewell is mine foreman.

About 25 per cent. of the product is marketed outside of the State.

Inspections were made on April 11th, July 27th, and November 16th.

With some few minor defects, as pointed out each time, the mine conditions were generally very good.

#### KENSEE MINE.

This mine is located at Kensee, and is operated by the Main Jellico Mountain Coal Co.: T. C. Dupont, president; Hywel



Davies, vice president and general superintendent, and W. D. McElhinney, secretary. John Burns is mine foreman.

About 60 per cent. of the product is marketed outside of the State, in various cities of the South.

The mine was inspected on April 2d, July 24th, and November 14th.

April: Except a door, as indicated, all underground conditions were good.

July: Ventilation had been impaired on account of a squeeze on second main entry, but was recovering to normal good conditions. Some bad top was noted.

November: Air volume abundant, but its conduction to workings was hindered from lack of curtains and brattices. Assurances were given that these repairs should be made at once.

#### PROCTER MINES.

These mines are located at Red Ash, and are operated by the Procter Coal Co.: Dr. A. Gatliff, president; H. F. Finley, secretary; and Philip Francis, superintendent. J. W. Ratcliff is mine foreman.

The list is taken from the 1899 report, as the yearly blank sent to the company was not returned.

The mines were inspected April 9th, July 23d and November 15th.

April: Some corduroying was needed on parts of main entry, near mouth of second right entry. Ventilation fair.

July: Drainage on Wood entry not good. Some improvement in ventilation in parts of the mine needed, as discussed with the superintendent.

November: Ventilation fair, but will be greatly improved as soon as some repairs are made so as to reverse the air current.

#### GRINSTEAD MINES.

These mines are at Red Ash, and are operated by the Procter Coal Co. H. W. Davis is mine foreman.

Inspected April 9th, July 23d and November 15th.

Some defects were found in the ventilation; however, they were small and easily and promptly remedied.

### STRUNK MINES.

These mines are located at Strunk, and are operated by the Pine Knot Coal Co.: A. McDonald, manager, and H. Swift is mine foreman.

Twenty-five per cent. of the product is sold at Atlanta and Chattanooga. No mining was done during September, pending a settlement of the wage scale for the ensuing year.

Inspected May 29, October 9, and January 3, 1901.

May: Conditions were good as to ventilation, and there was improvement as to drainage.

October: Mine was temporarily idle, and fan not running.

January, 1901: Better drainage needed, and ventilation weakened by leakage.

### TOW WAD MINES.

These mines are located near Pine Knot, and are operated by L. E. and D. C. Bryant, under name of Bryant Bros. A. J. Chitwood is superintendent.

Inspections were made May 29, October 9, and January 3, 1901.

May, No. 3 mine: Furnace insufficient, and consequently the ventilation was not good. The defects were discussed with the mine foreman and directions were given to remedy them.

October: The mine has just resumed work, after several weeks' idleness. With a few minor repairs made, as talked of with the foreman, conditions will be very good.

January, 1901: Some corduroying and drainage needed, but defective doors and curtains hindered good ventilation, and repairs were ordered made.

**WESTERN DISTRICT.**

This district is composed of eleven counties as follows: Butler, Christian, Daviess, Hancock, Henderson, Hopkins, McLean, Muhlenberg, Ohio, Union and Webster. Its production each year since 1893 is now given:

YEAR	Tons
1894 .....	1,806,966
1895 .....	1,784,278
1896 .....	1,762,461
1897 .....	2,114,571
1898 .....	2,071,070
1899 .....	2,739,511
1900 .....	2,933,398

**BUTLER COUNTY.**

The production of this county is from two mines, and as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Aberdeen .....	13,911	47	116	15,429
West Aberdeen .....	19,524	55	145	15,359
Totals .....	33,435	...	...	30,788

Loss, as compared to 1899, 2,647 tons.

These mines have transportation on Green River. All inspections by Logan.



**ABERDEEN MINE.**

This mine is at Aberdeen, near Morgantown, and is operated by the Aberdeen Coal & Mining Co.: I. B. Wilford, president; J. D. Render, secretary and superintendent. B. Baker is mine boss. The coal is marketed mostly at Bowling Green.

The mine being idle so long, the first inspection was not made, but inspections were made September 14, and January 16, 1901, and all necessary mine conditions were found to be good.

**WEST ABERDEEN MINE.**

This mine is also near Aberdeen and Morgantown, and is operated by the West Aberdeen Coal Co.: James F. Philips, president; T. C. Fuller, secretary and treasurer. James Calloway is mine boss. The coal is marketed at various points on Green river.

No inspection in the spring because of the strike. Inspected September 14 and January 16, 1901, and, with a few minor defects to be corrected, the mine was found to be in good condition.

**CHRISTIAN COUNTY.**

This county has but one mine, the one located at Empire, on the Louisville & Nashville railroad, and which is operated by the Empire Coal & Mining Co.: John D. Anderson, president; W. H. Buttorff, vice president; W. S. Carroll, secretary, and W. T. Rutland, general manager. James Bowie is mine foreman.

The mine is splendidly equipped with all modern machinery except as to mine haulage, and it is very productive. The vein worked is 44 inches thick, and of excellent quality, and is a good seller on the markets. 75 per cent. of the product was sold out of the State, but mostly in Nashville; Tennessee. The mine was opened in 1895, and has territory sufficient to continue operations for generations to come. The production for 1899 and 1900 is as follows:

1899..... 65,499 tons.....88 men.....271 days.

1900..... 82,663 tons.....94 men..... 247 days.

Gain over 1889, 16,954 tons.

Inspected by Logan, May 12th, and the mine was found to be in a very satisfactory condition.

Inspected by Stone, August 28th and December 29th, and found to be in splendid condition.

#### DAVIESS COUNTY.

This county has but one commercial mine. It is located near Mattingly, on the Louisville, Henderson & St. Louis railroad, and is operated by the New Holland Coal Co.: D. Stewart Miller, Sr., general manager, and D. Stewart Miller, Jr., superintendent. Post office, Owensboro. The vein worked is No. 9, and is  $4\frac{1}{2}$  feet thick. The new mine was opened in 1899 and will probably last 25 years.

There was a strike among the employes from the 8th to the 27th of February. The company stopped an entry which two men were driving and assigned them to other places, to which they objected, and the whole mining force quit work. The company intended to manage its own business, remained firm and the employes returned to work.

The production and other statistics of the mine for the year are: Output, 10,872 tons; average number of employes,  $21\frac{1}{4}$ , and days worked, 198. The output of 1899 was 8,617 tons, making a gain in 1900 of 2,255 tons.

The mine received three inspections by Mr. Logan during the year.

With its new equipments, it is probable that the company will add largely to its working force and tonnage in the present year.



**HANCOCK COUNTY.**

This county has but the one producing mine, the Falcon, located on the Louisville, Henderson & St. Louis railroad at Adair, and operated by M. H. Enright. Post office, Owensboro. M. H. Enright is general manager; C. W. Pettit is secretary, and John Dixon is the mine boss.

The company worked an average force of 23 men, for 241 days, and produced 5,869 tons, as compared to 8,152 tons produced in 1899. Forty days were lost on account of dull trade, and 10 days from lack of railroad cars.

The mine received 3 inspections during the year by Mr. Logan.

**HENDERSON COUNTY.**

The output of this county for the year from 5 mines, is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Corydon .....	8,040	11	177	6,618
Henderson .....	12,994	32	...	8,492
Peoples .....	5,607	8	...	6,830
Basket .....	64,290	81	183	56,574
Rankin .....	33,474	91	188	49,189
Totals .....	124,405	...	...	127,703

Gain over 1899, 3,298 tons.

All inspections in this county were made by C. W. Logan, Assistant Inspector.

**CORYDON MINE.**

This mine is located at Corydon, on the Ohio Valley division of the Illinois Central railroad, and it is operated by the Corydon



Coal Co.: W. H. Lloyd, general manager. Samuel Hopper is mine boss.

About half the year the company worked less than 6 men underground, when the mine was not subject to State supervision, and only two inspections were given it.

#### PEOPLES MINE.

This mine is located near Henderson, and is operated by the Peoples' Mining Co.: Jos. Gabe, president; F. C. Reinhardt, secretary, and Quin Bohn, superintendent.

The employees quit work on April 1st and resumed September 15th. During the suspension the members of the company operated the mine in person.

Three inspections were given the mine during the year.

#### HENDERSON MINE.

This mine is located near Henderson, and is operated by the Henderson Mining & Manufacturing Co. The employees went out on a strike April 1st, and no mining was done until June, and the rest of the year only by a small force. Three inspections were given the mine.

#### BASKET MINE.

This mine is at Basket, on the Nashville, Henderson & St. Louis division of the Louisville & Nashville railroad, and is operated by the Pittsburgh Coal Co.: Mrs. Alexandria Blair, general superintendent. John Blair is bank boss.

The product is all marketed in this State. Work was steady throughout the year. The vein worked is No. 9, and about 4 feet thick. Inspections were made May 4th, August 24th and December 20th.

May: Some hindrances to the ventilation were pointed out, and ordered to be remedied. Some of the entries needed sprinkling to keep down the dust.

August: Some defects found in the ventilation, as was discussed with the mine foreman.

December: There were 116 men in the mine, and 27,160 cubic feet of air per minute entering the mine, but on account of leakage and friction, only 6,600 cubic feet per minute was passing into the south side workings. Repairs were in progress to make the distribution of air good.

### RANKIN MINE.

This mine is at Spottsville, on Green river, and on the Louisville, Henderson & St. Louis railroad, and is owned and operated by Rankin Eastin, under the name of the Green River Coal & Mining Co. Rankin Eastin is the general manager, and Harry Eastin is the mine foreman.

The output of the mine would have been much larger but for the strike and suspension in April.

The mine was inspected May 5th, August 25th, and December 20th.

May: The mine was idle at the time, but inspected, and a number of defects on the air-course were noted and ordered corrected.

August: Air volume good and its distribution fair, except in first East entry, off first South, and directions were given to increase the air on this entry.

December: Ninety-five persons in this mine, and 14,900 cubic feet of air per minute was entering it, but there were some defects in its distribution to the workings, as was discussed with the mine foreman, and the necessary repairs were ordered made.

### HOPKINS COUNTY.

This county has become quite famous in many ways connected with the coal mining industry of the State.

First: It is by far the largest producer, its production being more than double that of any other county, and the business has become a permanent and fast growing success.

The yearly output, since January 1, 1896, has been as follows:

YEAR	Ton
1896 .....	777,182
1897 .....	961,412
1898 .....	961,716
1899 .....	1,265,706
1900 .....	1,353,740

On the basis of the 1896 output, the gain in four years has been 576,558 tons, or 74.31 per cent.

The production of the several mines for the year is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Earlington No. 9 .....	202,410	...	283	182,469
Earlington No. 11 .....	140,176	415	283	142,990
Hecla .....	62,088	91	269	79,101
Arnold .....	55,577	101	285	125,867
Barnsley .....	51,661	78	259	63,927
Diamond .....	169,335	172	284	129,465
St. Charles .....	141,276	183	265	148,323
Oak Hill .....	35,660	53	168	31,476
Carbondale .....	67,456	65	158	44,688
Crabtree .....	76,794	147	177	91,020
Monarch .....	64,269	125	276	79,309
Reinecke .....	179,005	235	279	235,105
Totals .....	1,265,707	...	...	1,253,740

Gain over 1899, 88,033 tons.



Second: This county has the largest coal producing company in the State, the St. Bernard Coal Co., at Earlington. The company officials are: John B. Atkinson, president; George C. Atkinson, secretary; and Ben W. Robinson, general manager.

This company operates the first seven mines named above, and for that purpose employs an average working force of about 1,050 men, who, during 1900, worked about 280 days, and produced 872,142 tons of coal. (The employes of the coking plant are in addition to the above.)

Third: This county has the largest coking plant in the State, the one at Earlington, and also operated by the St. Bernard Coal Co. This enterprise is very economical and valuable, in that it gives employment to 56 men in the operation of 135 ovens, and yearly converts a large amount of slack, or waste coal, into coke, which is sold in various markets of the country. During the year just past, 34,571 tons were produced by this plant, which, however, is not its full capacity.

Fourth: This country has the largest producing mine in the State, the Reinecke, at Madisonville, operated by the Reinecke Coal Co. During the year just closed, this mine gave employment to an average working force of 235 men, for 279 days, and produced 235,105 tons of coal.

Fifth: This county has the largest number of employes engaged in the industry of any county in the State, representing a total wage earning force of nearly 2,000 persons.

Sixth: The county is noted for its continuous mine operations and extraordinary tonnage resulting from harmony between the mine operators and their employes.

Seventh: It is noted for the splendid equipment of its mines, with the best facilities for fast production, while the dangers and hardships incident to mine labor are reduced to the minimum, and we note that it has in reserve areas of undeveloped coal sufficient to keep these and many new mines running with increased force for generations to come.

Hopkins county is to be congratulated upon its possession of

such a great and thriving industry, and should foster and maintain it with unfaltering devotion, and be quick to dissipate any and all attempts to cripple or destroy it. It is the source of its local prosperity, and the advance movement of a great future. It gives remunerative wages to its laborers, prosperous trade to its merchants, and a steady market for its farm products, and by it the county has largely increased in population and material wealth, until the tax lists are swelled to vast proportions with valuable assessments which help support the town, county and state governments. It is: "The goose that lays the golden egg."

If this industry shall be torn down, business prostration will follow, and want will stalk abroad and come like an "armed man" to a thousand homes.

Hopkins county has a class of mine employes as moral and as intelligent as those of any other county or State. They know their condition, their needs, and their business, and are capable of attending to the same without dictation from other people, and if need be without their aid or consent, and they should be allowed to do so without hindrance or intimidation. They are a well paid, prosperous, and contented people, fitly representing that class of labor that is the main-spring of every business enterprise, and makes solid and permanent the foundation and structure of all stable governments. If they are satisfied with their lot, (and they seem to be) then they ought to be let alone, that they may reap the fruits of their toil in peace, and without molestation or the fear of violence.

If a man is sick he knows it better than anybody else, and he will complain without persuasion or coercion, and if he is well, he doesn't want another to tell him that he is out of fix and that he ought to lay up and send for a doctor, nor to be molested while pursuing his chosen avocation, for not heeding such advice.

These comments are not written in criticism or disparagement of the mining interests of any other section, but in simple justice to the Hopkins county miners, who, for exercising their constitutional right of free choice as to the manner and price of their



labor, seem to have become the subjects of severe criticism and condemnation upon the part of some of their brethren of other counties. Let them, like other people, work out their own destiny in their own way.

Over 57 per cent., or 773,000 tons, of the county's production was marketed out of the State, and mainly in Nashville, Memphis, and other cities and towns of Tennessee, but some of it was sold at Evansville, Indiana.

Over 77 per cent., or 1,044,700 tons, of the output was mined with machines of various manufacturers. All the mines in this county, except the Crabtree, Carbondale, and the St. Charles, have transportation over the Louisville & Nashville railroad, St. Louis division.

#### EARLINGTON MINES.

These mines, known as Nos. 9 and 11, because located in coal veins of those numbers, are near Earlington, and are operated by the St. Bernard Coal Co.

They were inspected during the year in the months of May, September, and December. Mr. Evans is superintendent at No. 11.

May 1st, No. 11, by Logan: Conditions fair. New furnace being built.

May 2d, No. 9: Slight defect in the ventilation on third West entry. Other conditions good.

September 3d, No. 9, by Logan: All essential mine conditions satisfactory.

September 5th, No. 11: Some curtains needed renovating, and some bratticing done. Otherwise the conditions were satisfactory.

December 22d, No. 9, by Logan: Ventilation on fourth right, off first East entry, was defective on account of bad curtain.

December 20th, No. 11, by Stone. I note new furnace on the right, which improves ventilation very much. All necessary mine conditions very good.



## REINECKE MINE.

This mine is near Madisonville, and is operated by the Reinecke Coal Co.: C. Reinecke, Bellville, Illinois, president; I. Bailey, Madisonville, Ky., secretary and general manager; Louis Feger, superintendent of the mine.

Inspected in April by Logan, and in August and December by Stone.

April 27th: Conditions good, but the air-current was barely sufficient and a better volume was recommended.

August 28th: The mine was in good condition generally.

December 29th: All mine conditions found to be good.

## CRABTREE MINE.

This mine is operated by the Crabtree Coal Mining Co., post office, Illsley. The company officials are: A. Howell, Clarksville, Tennessee, president; R. M. Salmon, Illsley, Ky., secretary and general manager. John Harland is superintendent of the mine. Transportation over the Illinois Central railroad.

Inspected May 11th by Logan and found to be in good condition.

Inspected August 16th by Stone: Ventilation too weak on fifth and sixth East entries. Some neglect in posting rooms. Otherwise the mine was in good condition.

Inspected December 18th by Stone, and all conditions found to be good.

## CARBONDALE MINE.

This mine is operated by Booth & Glover, post office, Hamby Station. John Palmer, mine foreman. It has transportation over the Illinois Central railroad.

Inspected May 11th, by Logan: Conditions generally good.

Inspected August 28th and December 18th by Stone.

August: Ventilation is good, except on sixth entry workings, on North side, and it must have improvement.

December: All mine conditions found to be good, better than ever before, except bad oil makes too much smoke.

#### ST. CHARLES MINES.

These mines are located near St. Charles, on the Illinois Central railroad, by which it has transportation. They are operated by the St. Bernard Coal Co., post office, Earlington, Ky. George Faults is superintendent of the mines.

Inspected by Logan, May 11th, and all conditions found to be good.

Inspected by Stone in August and December.

August 16th, No. 2: Ventilation on sixth left entry very fine, because of new place of intake, but on eighth right some improvement was needed. Other conditions good.

New Mines, August 17th: Conditions satisfactory.

December 17th: No. 2 found in good condition generally, and new mine visited, but owing to the character of the work in different hills an inspection was not deemed necessary, and none was made.

#### HECLA MINE.

This mine is located near Earlington, and is operated by the St. Bernard Coal Co.

It was inspected by Logan May 1st. A few minor defects were noted as to the condition of the air-current, and, excepting these, the mine conditions were reasonably good.

Inspected by Stone August 17th, and conditions were found to be good, and again on December 20th, and the mine was found to be well ventilated and in a satisfactory condition generally.

#### DIAMOND MINE.

This mine is located at Morton's Gap, and is operated by the St. Bernard Coal Co., post office, Earlington. James Blanks is superintendent of the mine.



Inspected by Logan May 10th and September 6th, and by Stone December 29th.

May: Conditions good, except as to ventilation which was barely sufficient for the force inside the mine.

September 6th: Conditions the same as in May, and a better air-volume is recommended.

December: Workings on North entry in good condition generally, but the ventilation was quite deficient in left workings caused by temporary defect in the fan.

#### BARNSLEY MINE.

This mine is at Barnsley, and is operated by the St. Bernard Coal Co., post office, Earlington. Rousseau O'Bannon is superintendent of the mine.

Inspected by Logan May 10th and September 5th, and by Stone December 20th.

May: Air volume not sufficient, and suggestions were made as to its increase. Entries much too sloppy, but working places were dry.

September: Conditions not very good.

December: I note the new furnace in the second hill, which improves the ventilation. The entire mine was found to be in very good condition.

#### ARNOLD MINE.

This mine is near Earlington, and is operated by the St. Bernard Coal Co. Mr. Rule is superintendent of the mine.

It was inspected by Logan May 2d and September 4th, and found to be in excellent condition.

Inspected by Stone December 21st and "found to be in most excellent condition in all respects."

#### OAK HILL MINE.

This mine is near Nortonville, and is operated by the Oak Hill Co.; J. H. Trathen, general manager; W. H. Hall, Jr., secretary.



May: Mine visited but idle. No work for several weeks, and no inspection was made.

Inspected by Stone August 17th and December 21st, and excepting a few minor defects was found to be in good condition.

#### MONARCH MINE.

This mine is near Madisonville, and is operated by the Monarch Mining Co.: R. S. Dulin, Jr., president; W. T. Anderson, secretary and treasurer.

It was inspected by Logan April 28th, September 3d, and December 21st.

April: A volume of 19,760 cubic feet of air per minute was going into the mine, and it was reasonably well conducted to all the working places. Numerous observations were made as to the best mode of reclaiming the east side of the mine from the effects of the late squeeze, and divers instructions were given relative to mine conditions in general.

September: Much improvement in shaft is noted. Twenty-three thousand cubic feet of air per minute was entering the mine, and with curtains renovated, as talked with the mine foreman, its conduction will be fair. There were ninety men inside the mine. Further discussion was had as to the squeeze, and the original plan of the inspector was finally agreed upon, and positive assurances were given that it would be carried out.

December: One hundred persons at work in the mine and 21,600 cubic feet of air per minute was going into it, but owing to bad curtains, etc., it was not as well conducted through all the workings as it ought to have been. The fan is barely adequate to the necessities of the mine. General instructions were given.

**McLEAN COUNTY.**

The production of this county was made by the two mines at Island on the Owensboro & Nashville division of the Louisville & Nashville railroad. One is operated by the Field Coal Co., and the Island mine by various parties during the year. The usual inspections were given during the year, all by Mr. Logan. The output of the Island mine was not reported for the last half of the year, and the same was estimated as I thought fair. The production of the two mines for the year was as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Field .....	21,168	38	146	18,616
Island .....	7,627	...	...	12,700
Totals .....	28,795	...	...	31,316

Gain over 1899, 2,521 tons.

**MUHLENBERG COUNTY.**

This county has eight mines in active operation, and another in preparation. It stands fourth in point of production, and might be equal to any if the same efforts were made as in other counties to obtain it. The county is more generally underlaid with rich veins of coal than any other section of the State, and all it lacks is development.

These mines do not average in capacity and working force with some in other counties, but as a rule they are well equipped with modern machinery and are doing splendid work, and in proportion to the time and number of employes engaged they are as productive as any in the State. Machine mining and mechanical haulage are rapidly superseding the former methods. The Crescent, Black Diamond, Hillside, and Oakland mines have electric



mining plants, and the Crescent, Black Diamond, and Central, have underground haulage by electric motors. With such vast natural resources and facilities for their utilization, Muhlenberg county is destined to grow in wealth and influence far beyond the expectations of its most sanguine citizens.

As compared to 1899, there was a loss in the output of the mines of 5,265 tons. This was the result of two main causes, as has been discussed in other parts of this report. I refer to the strike in April over a demand for an increase in the mining scale, and to the squeeze in Central mine. In the absence of one of these there would have been a fair gain, and in the absence of both, the per cent. of gain would have been large.

The mines worked eight hours per day, but in all the tables the time is reduced to days of ten hours each. This is done for uniformity of basis. In so far as this report is concerned all days must be the same so that the reader will not be misled or become confused in making comparisons. Formerly all mines in the State made ten hours constitute a day's work, and this is still the rule in different sections, while some mines work nine hours per day.

The mine statistics for the year is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Central .....	130,805	194	166	86,261
Powderly .....	40,368	94	149	52,863
Hillside .....	38,707	74	118	45,891
Oakland .....	35,414	65	108	43,885
Crescent .....	66,427	151	170	61,228
Mud River .....	12,622	50	120	13,199
Pierce .....	53,072	100	172	54,224
Bevier .....	37,431	69	165	52,030
Totals .....	414,846	...	...	409,581

Loss, as compared to 1899, 5,265 tons.



## CENTRAL MINE.

This mine is at Central City, and has transportation over the Illinois Central and the Owensboro & Nashville division of the Louisville & Nashville railroad. It is owned and operated by the Central Coal & Iron Co.: T. C. Dupont, president; S. Coleman, secretary; and C. B. Finley, general manager. E. A. Foster is superintendent of the mine.

About 30 per cent. of the product is marketed outside of this State. The mine has about recovered from the effects of the late squeeze and its normal output is expected for the present year.

Inspected by Logan, February 19th: Ventilation on west side insufficient, but a new air-shaft is being sunk, and when completed the air will be good. Plenty of air is passing into the East side of the mines, but its conduction is greatly retarded by friction. Some air-bridges were recommended, as was talked of with mine foreman.

Inspected June 25th and November 2d by Stone.

June: I note the completion of the new air-shaft on West side, which makes the ventilation and all other conditions there very good. On the East side the squeeze has shut off mining, but a small force is employed to repair the main entry and air-way and reopen the works.

November: Sixty men on the West side, and air-volume abundant, and well distributed through the workings, and all other conditions satisfactory.

East side: Repairs still in progress. A new air-shaft is to be sunk on this side. The same is a necessity to proper ventilation, and its importance was urged.

## POWDERLY MINE.

This mine is at Powderly, on the Illinois Central railroad, and is operated by the Central Coal & Iron Co., post office, Central City. John Jones is mine superintendent.

On account of the strike no inspection was made until June, when it was examined by Stone, and again by him in November. The mine was found each time in most excellent condition generally. The new entrance connecting with the bottom of the shaft, for the passage of men and mules, and the drain are valuable improvements.

#### HILLSIDE MINE.

This mine is located at Mercer Station, on the Illinois Central railroad, and is owned and operated by the Hillside Coal Co., composed of J. W. Lamb and Wm. Eades. John Garrett is mine foreman.

Seventy-five per cent. of the output is sold in markets out of this State, and all of it is machine mined.

Inspected June 23d and November 1st by Stone.

June: Various defects to good ventilation were noted and ordered to be remedied.

November: Drainage good, and ventilation fair. One curtain was needed, as indicated to Mr. Garrett.

#### OAKLAND MINE.

This mine is located at Mercer Station, on the I. C. railroad, and is operated by the Oakland Coal Co.: Wm. Eades, general manager, and J. W. Lamb, secretary and treasurer. George Miller is mine foreman.

The most important event of the year with this mine was the completion of a second outlet. It had been on hand a long time, and was finally made by connection with an entry of Hillside mine. All its product is machine mined, and 75 per cent. of it is sold out of the State.

It was inspected by Stone, June 25th and November 1st.

June: Ventilation defective, as indicated in notice of inspection.

November: Ventilation fair. The furnace and air-shaft are at



the side of the main shaft where the air-current enters the mine. They are badly located, and it is only a short time before they must be provided at a different place in order to properly ventilate the mine.

#### PIERCE MINE.

This mine is located at Drakesboro, on the O. & N. division of the Louisville & Nashville railroad.

It is operated by the Black Diamond Coal Co.: James T. Pierce, president; H. W. Buttorff, vice president; W. W. Bridges, secretary and general manager. W. T. Davis is foreman at the mine.

The entire product is mined with machines, and about 40 per cent. of it is sold out of the State.

Inspected by Logan May 14th, September 8th and January 11th, 1901.

May: Seventy men inside; air-volume abundant, but its conduction to the workings was not good, owing to defects on the air-course.

September: Conditions in general good. Some minor defects were noted.

January: Air-volume abundant, some deficiency in its distribution. Other conditions good.

#### CRESCENT MINE.

This is the old Memphis mine, at Bevier, on the O. & N. division of the Louisville & Nashville railroad. It is operated by the Crescent Coal Co.: W. R. Cole, president; A. H. Robinson, vice president; F. P. Wright, secretary; and Frank S. Washburn, general manager. Charles Hendrie is mine foreman.

Since the installation of the new mining plant, all the product is under-cut with machines, and 75 per cent. of it is sold out of the State.

Inspected by Logan May 14th, September 7th, and January 10th, 1901, and very satisfactory mine conditions were found to exist throughout the year.



## BEVIER MINE.

This mine is located at Bevier, and has transportation over the O. & N. division of the L. & N. railroad. It has a fan for ventilation and mining is done with picks. Half of its output is sold outside of this State. The mine is operated by the Bevier Coal Co.: J. W. Bastin, president; R. S. Lytle, secretary; and Geo. Givens, general manager. James Stephens is mine foreman.

Inspections were made by Logan May 14th, September 7th, and January 10th, 1901.

May: Seventy men inside and a volume of 19,200 cubic feet of air per minute was entering the mine, and it was well conducted through the workings, and drainage also good.

September: Ventilation good, but mine needs better drainage.

January: Drainage good. Ventilation satisfactory except on first North entry.

## MUD RIVER MINE.

This mine is at Mud River, and is connected by branch road with the O. & N. division of the Louisville & Nashville railroad at Penrod, and it is operated by the Mud River Coal, Coke & Iron Co., Joseph Cain, superintendent.

The mine was inspected by Logan in September. It was idle on the first round, and on the last an inspection was not deemed of any importance and none was made.

## OHIO COUNTY.

This county stands well up in production, being third on the list. It has nine producing mines, all located on the main line, (or the Owensboro branch) of the Illinois Central railroad except the Jamestown, which is on Green river.

Their production is far short of their actual capacity. The strike in April materially affected the tonnage, and, in common with many other sections, lack of railroad cars at times was a serious hindrance. This county has a large area of undeveloped

coal, and is capable of increasing its output to any amount desired, as the number of mines can be increased any year and to any number wanted.

The output of the year is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Taylor .....	124,704	186	217	130,273
Render .....	102,737	170	170	111,231
McHenry .....	101,813	177	...	101,321
Echols .....	76,549	131	151	76,789
Williams .....	55,476	127	180	60,087
Fordsville .....	6,829	24	162	8,601
Dean .....	32,400	45	168	27,966
Louise .....	10,697	39	...	17,035
Jamestown .....	4,662	16	136	2,397
Totals .....	515,867	...	...	535,700

Gain over 1899, 19,633 tons.

#### TAYLOR MINE.

This mine is operated by the Taylor Coal Co.: J. P. Speed, president; W. A. Jones, secretary; I. P. Barnard, general manager. Post office, Taylor Mines. Nicholas Barrass is superintendent of the mine.

Thirteen mining machines are employed to under-cut the coal, and are operated by compressed air, and during the year just closed an electric haulage plant was installed. Two motors, one of ten tons and the other of seven tons weight, are run over a 40-pound steel rail track 7,600 feet long, that reaches all the re-

mote workings of the mine. Louisville is the principal market, though 20 per cent. of the output was taken to Memphis.

Inspections were made by Logan, February 16th, and by Stone, June 20th and November 10th, and all essential mine conditions were found to be the very best. In fact, it is not expected to find them otherwise as long as it is under the present management, unless it be the result of accident or of something other than the ordinary run of matters.

#### RENDER MINE.

This mine is at Render, and is operated by the Central Coal & Iron Company. Post office, Central City, Ky. E. A. Foster is superintendent of the mine, but the name of the foreman is not given.

This mine has electric machine mining and motor haulage. Its product is marketed in Louisville and Memphis.

It was inspected by Logan, February 20th and found to be in fairly good condition.

Inspected by Stone, June 13th and October 31st.

June: Ventilation throughout the north workings fair, but the current was weak and some improvement was needed. The ventilation on the south side was quite deficient, and directions were given to make it materially better at once or the works must stop. In the latter workings I estimate the air volume to be about 50 per cent. below the legal requirements. The furnace was not sufficient, and some repairs were necessary.

On June 30th, the general manager of the company, Mr. W. G. Duncan, wrote to the office as follows:

"I will say that your report was duly received, and I made a personal inspection of the Render mines and find that you had just cause for complaint," etc. He named certain improvements made, and others contemplated, until the employes were satisfied with the work of the company in restoring good ventilation, and sent to the office the following letter from the mine committee at that place:



"Render, Ky., June 26, 1900.

At a meeting of the miners we agreed to continue work under the improvements that have been made and the plans carried out as laid down for the future for the improvement of the mine ventilation.

Signed

P. LANDER, Pres.  
ROBERT ENGLEBY, JR.,  
CLYDE ROWE,  
H. C. SHULZ,

Committee.

October: "Conditions much improved since date of last inspection. Ventilation now very good. Drainage good. The drain leading to the second outlet should be planked over so as to make it passable, and a ladder should be placed in the opening so as to make ingress and egress easy."

#### McHENRY MINE.

This mine is located at McHenry, and is operated by the McHenry Coal Co.: T. C. Dupont, president; S. Coleman, secretary; C. B. Finley, general manager, and E. A. Foster, mine superintendent.

About 50 per cent. of the product was machine mined, and 30 per cent. of it was sold out of the State. Louisville and Memphis are the principal markets. The mine has rope haulage and is ventilated by a fan.

Inspections were made February 21st by Logan. "Drainage satisfactory except on the ninth south entry, which is bad. Ventilation reasonably good; 19,800 cubic feet of air per minute entering the mine and 135 men inside. An air bridge near tenth north entry was discussed with the mine foreman, and was recommended as beneficial. Some black damp was found."

June 14th inspected by Stone. The ventilation very good in all south workings, also on tenth north workings, and fair on twelfth north workings, but quite deficient on eleventh north

entry, on account of leakage at parting and other places. The air volume going into the mine is great, but too much escaped to the south before reaching the tenth north. The volume on tenth north must be greatly increased so as to supply the eleventh north.

Inspected October 3d by Logan. The mine ventilation was bad. The air volume was abundant, 29,570 cubic feet of air per minute entering the mine, but it was quite deficient in its distribution. The fan being on the left, and the first workings being on the right, tenth north, there were but 11,000 cubic feet of air per minute going into the tenth north, and but 7,360 cubic feet passing through room 24 into eleventh north entry, and at head breakthrough, on twelfth north entry, there were but 4,800 cubic feet. About the same volume was found on the south entries until the ninth south was reached, where 14,780 cubic feet were found. Plans to make the ventilation better were fully discussed with the mine foreman, and directions given accordingly, among which was to discontinue the tenth north workings, in order not to encounter the black damp that was affecting those workings and being carried forward with the air current. The idea was to turn the whole fresh current up the eleventh north entry.

#### ECHOLS MINE.

This mine is at Echols, and is operated by the McHenry Coal Co. (see McHenry mine). All its product is machine mined, and about 30 per cent. of it is sold out of the State.

It was inspected February 20th by Logan; 115 persons in the mine, and 15,500 cubic feet of air per minute were entering the mine, but improvement was needed in its distribution, as was pointed out to the mine foreman.

Inspected June 15th and October 31st by Stone.

June: Ventilation fair, but the air volume was weak and must be stronger. The furnace is not sufficient for the mine, and better power must be provided.



October: Ventilation good on fifth and sixth north entries, and on fifth and sixth south entries, but only moderate on the seventh and eighth north entries, and quite deficient on seventh and eighth south entries, and improvement should be made at once. Some curtains were needed, as indicated to the mine foreman.

#### WILLIAMS MINE.

This mine is located near McHenry, and is operated by the Williams Coal Co.: J. S. Williams, president and general manager; E. Rhoads, secretary. Andrew Sharp is mine foreman. 60 per cent of the product was marketed outside of the State.

Inspected February 21st by Logan, and all conditions were found very good.

Inspected by Stone, June 15th and October 30th, and the mine conditions, as regards ventilation and drainage, were found to be first class, but there was neglect in posting rooms, and in many parts of the mine the pillars were left too thin, and warnings were given against the practice.

#### FORDSVILLE MINE.

This mine is at Fordsville, and is operated by the Fordsville Block Coal Co.

It was visited by Logan, February 17th, but was found idle. No one was about and no inspection was made.

Inspected by Logan, August 21st. Drainage on first south and main entries not good, and they must be corduroyed. Ventilation was defective. Furnace needed renovating.

Inspected by Logan December 14th. Very little fire in the furnace, but mine had been running and a fair current was going through the mine.

#### LOUISE MINE.

This mine is located at Deanfield, and is operated by the Deanfield Coal Co. Post office, Aetnaville, Ky.



All inspections by Logan.

Visited February 17th: Mine idle, and had been idle since February 3d. No inspection was necessary and none was made.

August 22d: After a two months' idleness, the mine is ready to resume, and conditions are being made good as fast as possible.

December 15th: Curtains needed renovating in order to improve the ventilation. Drainage not very good.

#### DEAN MINE.

This mine is the shaft, and is also operated by the Deanfield Coal Co. All inspections by Logan.

February 17th: Ventilation not improved since date of last visit, and warning was given that it must be made better or the matter would be taken to the courts.

August 21st: Hoisting cage and shaft in need of repairs. With a few repairs on the air course there would be good air all through the mine, the volume entering being 14,800 cubic feet per minute, and only 60 men inside.

Inspected December 14th, and the ventilation found to be fair. Other conditions also found to be fairly good.

#### JAMESTOWN MINE.

This mine is a small one on Green river, and is operated by the Jamestown Coal Co. Post office, Pt. Pleasant, Ky. The company officials are: F. O. Coffman, president, and H. O. Coffman, secretary and treasurer. H. Maxwell is mine foreman.

All inspections were made by Logan. Ventilation was found to be defective and instructions were given to remedy the same.

#### UNION COUNTY.

There are six producing mines in this county, but one is hardly subject to the mining law, and another was opened late in the year, but run no coal. Their production was as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Tradewater .....	79,180	110	136	89,398
Cumberland .....	70,247	91	157	72,392
DeKoven .....	11,716	122	202	71,368
Davidson .....	4,035	8	207	4,194
Sullivan .....	2,611	.....	.....	1,739
Totals .....	167,789	.....	.....	239,091

Gain over 1899, 71,302 tons.

All the mines in this county are located on the Ohio Valley division of the Illinois Central railroad.

The first and second round of inspections were made by Logan, and the last one by Stone.

#### TRADEWATER MINE.

This mine is at Sturgis, and is operated by the Tradewater Coal Co. It has underground rope haulage, and a well-equipped mining machine plant. The vein worked is No. 9, and 5 feet thick. Altogether it is a fine property and doing good work. Two-thirds of its production was marketed outside the State.

Inspected May 8th: 12,220 cubic feet of air per minute were passing into the west entries, but as the coal yields fire damp, break-throughs were ordered to be made every 35 feet, and an examination of the workings were enjoined every morning, by a competent person with a safety lamp, before the workmen were allowed to go on the same. A new furnace was ordered built on the slope to aid the general ventilation. The second outlet was insufficient, but the slope when cleaned out will answer the purpose.

Inspected August 30th: A volume of 27,000 cubic feet of air was

passing into the mine, and only 95 men inside, and it was reasonably well conducted to the workings. Furnace not yet built on the slope.

Inspected December 26th by Stone. All mine conditions fair except as to ventilation, which needed some improvement. The furnace heretofore ordered will have to be built.

#### CUMBERLAND MINE.

This mine is near Sturgis, and is operated by the Paducah Coal & Mining Co.; T. J. Flournoy, president; Isaac Reese, vice-president; George Wallace, secretary; D. A. Brooks, Jr., superintendent. Charles Welch is mine foreman.

The product of the mine is marketed mostly in Paducah and Memphis. About 45 per cent. of it is taken out of the State.

Inspections were made May 9th, August 29th and December 26th. The mine each time was found to be in most excellent condition.

#### DEKOVEN MINES.

This mine is located at DeKoven and is operated by the Ohio Valley Coal & Mining Co. Samuel S. Brown, Pittsburgh, Pa., president; Samuel P. Sturgis, secretary and general manager, and John Whitehead, mine superintendent.

About 70 per cent. of the product is mined with machines run by compressed air, and about 50 per cent. of it is marketed at Memphis, Tenn.

The vein worked is 4 feet 10 inches thick. The mine was opened in 1891, and will last for a half century to come.

It was inspected May 9th, August 28th and December 26th and the mine was found to be in excellent condition.

#### DAVIDSON'S MINE.

This mine is at Uniontown and is operated by B. L. Davidson & Sons.

Inspected May and August and found to be in satisfactory con-



dition. Much of the time this mine is not subject to State supervision, because not working more than five men underground.

#### SULLIVAN MINE.

This mine is near Sullivan and is operated by James Lamb, but as less than six men are worked on an average underground, the same is not subject to law, and no attention was given it.

#### AMERICAN MINE.

This is a new mine at Uniontown and is operated by the American Coal & Iron Co. A. W. Voegty, president; R. A. Brashear, secretary; S. L. Brashear, general manager; D. E. Caulton, mine foreman and auditor.

An output is expected for the present year.

#### WEBSTER COUNTY.

There are four producing mines in this county; two at Providence, one at Sebree and one at Wheatcroft.

Those at Providence, one a shaft and the other a slope, are operated by the Providence Coal Co. W. A. Nesbit, president; Percy D. Berry, vice-president, and W. J. Nesbit, secretary. W. J. Garrett is superintendent of the mine.

The slope mine is splendidly equipped with an electric mining and haulage plant, electric motor, etc. About 80 per cent. of the product is sold in Nashville and Memphis, Tenn.

The output of the mines is as follows:

MINES	1899	1900		
	Tons	Av. Em.	Days	Tons
Providence .....	67,030	105	225	76,416
Sebree .....	40,214	48	157	25,986
Wheatcroft .....	.....	11	.....	3,773
Totals .....	107,244			106,175

Loss, as compared to 1899, 1,069 tons.

All the inspections in this county were made by Logan.

## PROVIDENCE MINES.

These mines were inspected April 30th. Ventilation inadequate, especially on the 8th and 9th left entries where black damp is abundant and the air intolerable. The fan, owing to its location, is not sufficient. The best mode of remedying this matter was discussed with the mine foreman, and instructions given accordingly.

Inspected September 3d: A new fan was sending a volume of 54,800 cubic feet of air per minute through the mine and making the ventilation splendid.

Shaft mine: Conditions fair.

Inspected December 21st: Ventilation good and all other conditions satisfactory.

## SEBREE MINE.

This mine is located at Sebree and is operated by the Sebree Coal Co. S. F. Powell, president; H. C. Bailey, vice-president; J. A. Powell, secretary; J. B. Ramsey, treasurer; C. F. Hall, assistant treasurer and manager; J. L. Jackson is foreman of the mine.

One-half the mine product is marketed outside the State.

The mine was visited on May 3d, but was idle and had not been in operation for some time and no inspection was made.

August 30th: Inspected and conditions found to be very good.

December 20th: Some minor repairs were needed, as was talked of with the mine foreman and named in the notice of inspection.



## ILLINOIS COAL PRODUCTION.

The coal product of Illinois for the year ending June 30, 1900, as compiled by the Bureau of Labor Statistics, at Springfield, Ill., and other data connected with the industry follows:

Total output of all coal mines in tons of 2,000 lbs. ....	25,153,929
Total output of shipping mines, tons .....	24,056,996
Total tons of lump coal .....	13,927,899
Total tons of other grades .....	11,226,030
Total tons shipped .....	21,009,803
Aggregate home value of total product .....	\$22,510,360

Other statistics follow:

Number of counties producing coal .....	52
Number of mines and openings of all kinds .....	920
New mines, or old mines re-opened, during the year .....	138
Mines closed or abandoned since last report .....	107
Number of shipping mines .....	323
Number of mines in local trade only .....	597
Output of local mines, tons .....	1,096,933
Tons supplied to locomotives at the mines .....	884,082
Tons sold to local trade .....	2,170,281
Tons consumed (or wasted) at the plant .....	1,089,763
Average days of active operation for shipping mines .....	214
Average days of active operation for all mines .....	182.5
Average value per ton, all grades, at the mines .....	\$0.8949
Average value per ton of all lump coal at the mines .....	\$1.099
Average value per ton of other grades .....	\$0.6446
Number of mines in which mining machines are used .....	51
Number of mining machines in use .....	430
Number of tons undercut by machines .....	5,583,594
Average number of miners employed during the year .....	27,875
Average number of other employes .....	11,509
Total employes .....	39,384
Number of men at work underground .....	35,203
Number at work on surface .....	4,181
Average price paid per gross ton for all hand mining .....	\$0.5045
Average price paid per gross ton for machine mining .....	\$0.3578



REPORT OF INSPECTOR OF MINES.

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Number of kegs of blasting powder used .....	495,467
Number of men accidentally killed .....	95
Number of wives made widows .....	53
Number of children left fatherless .....	136
Number of men injured so as to lose a week or more of time .....	615
Number of gross tons mined to each life lost .....	264,778
Number of employes to each life lost .....	415
Number of gross tons mined to each man injured .....	40,901
Number of employes to each man injured .....	64

## FATALITIES IN COAL FIELDS.

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The record of Kentucky as to fatal accidents in coal mines is better than that of any other State, Territory or Government in all North America. This fact is brought out in an article by Mr. F. L. Hoffman, and published in the Engineering and Mining Journal of November 24, 1900. Mr. Hoffman has had access to all the records and he tells the facts as they exist.

The article is well worth preserving and is therefore given a place in the annual report. We are aware that mining conditions are widely different in different sections and that the dangers incident to coal mining are not uniform, but vary in the several districts, and often in the same district, but challenging a comparison of all conditions, whether favorable or unfavorable to mine accidents, Kentucky can and will stand by this record as the best made in any country for the period named, and fears neither condemnation nor criticism at the hands of the public.

The article referred to is as follows:

During the year 1899, the actual and comparative frequency of fatal accidents in coal mining operations has been greater than during any year of the preceding decade, excepting 1891. While the average rate for the ten years 1890-1899 is shown to have been 2.64 per 1,000 of men employed, the rate for 1899 is returned as 2.99 per 1,000, a material increase, for which it is difficult to ascertain a definite cause. The total number of lives lost in coal mining operations is shown to have been 1,200 during 1899, against 1,076 during 1891.

The first table will show the total number of persons killed in coal mining in the United States and Canada during each of the years forming the period 1890-1899.

## Number of Persons Killed by Accident in Coal Mines in the United States and Canada, 1890-1899.

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	Total
Colorado .....	16	30	34	46	19	23	68	35	24	41	336
Illinois .....	53	60	57	69	72	75	77	69	75	84	691
Indiana .....	5	5	19	22	*	23	28	16	22	16	156
Indian Territory .....	*	*	*	*	13	6	12	22	17	25	96
Iowa .....	13	19	24	29	19	20	22	21	26	20	213
Kansas .....	8	13	*	15	26	10	12	6	17	16	123
Kentucky .....	11	16	8	12	10	8	6	12	6	7	96
Maryland .....	8	6	6	5	7	9	6	5	4	5	61
Missouri .....	10	18	20	21	19	13	16	8	9	14	148
New Mexico .....	*	*	*	*	*	28	7	7	7	15	64
Ohio .....	42	44	42	32	45	52	41	40	52	57	447
Pennsylvania (anth.) ..	378	427	396	425	439	420	502	424	411	461	4,283
Pennsylvania (bit.) ....	146	237	133	131	124	155	179	149	199	258	1,711
Tennessee .....	*	22	14	11	14	40	22	10	19	20	172
Utah .....	*	*	*	2	1	1	3	3	3	...	13
Washington .....	*	*	55	9	50	35	8	7	9	42	215
West Virginia .....	*	36	36	72	59	83	65	62	90	89	592
British Columbia .....	4	15	6	16	4	10	9	6	7	11	88
Nova Scotia .....	7	128	9	2	13	9	8	7	7	19	209
<b>Total .....</b>	<b>701</b>	<b>1,076</b>	<b>859</b>	<b>919</b>	<b>934</b>	<b>1,020</b>	<b>1,091</b>	<b>909</b>	<b>1,004</b>	<b>1,200</b>	<b>9,713</b>

\*No report.

It is shown that in the aggregate 9,713 lives have been lost during the ten years under consideration. It is unfortunate that for a few States the records are not quite complete, but the omissions have been indicated so as to avoid an erroneous interpretation of the table.

The following table will show the fatality rate per 1,000 of men employed in each of the States and provinces during the ten years under consideration. The States for which the record is not quite complete have been indicated in order to avoid any error in the interpretation of the table:



Fatal Accidents in Coal Mining in the United States and Canada, 1890-1899.  
Number of Persons Killed per 1,000 Employed, 1890-1899.

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	Total.
Colorado .....	2.27	4.40	4.49	6.31	3.06	3.05	10.07	4.99	3.23	5.60	4.73
Illinois .....	1.85	1.82	1.69	1.95	2.21	2.35	2.33	2.04	2.14	2.27	2.07
Indiana .....	0.76	0.72	2.50	2.95	*	2.92	3.94	2.00	2.63	2.07	2.32
Indian Territory .....	*	*	*	*	3.95	1.64	3.26	6.34	4.82	6.24	4.39
Iowa .....	1.31	2.08	2.58	2.77	1.85	1.82	2.62	2.45	3.38	2.49	2.30
Kansas .....	1.77	2.08	*	1.52	2.58	1.11	1.36	0.71	1.95	1.57	1.62
Kentucky .....	1.50	2.49	1.04	1.41	1.25	1.02	0.79	1.55	0.67	0.83	1.22
Maryland .....	2.08	1.54	1.52	1.23	1.69	2.30	1.58	1.17	0.89	1.08	1.49
Missouri .....	1.67	2.62	2.48	2.70	2.49	1.84	2.41	1.22	1.22	1.80	2.06
New Mexico .....	*	*	*	*	*	16.88	4.87	5.13	3.71	7.98	7.78
Ohio .....	1.89	1.83	1.56	1.11	1.43	1.79	1.44	1.89	1.77	2.03	1.61
Pennsylvania (anthracite) .....	3.21	3.47	3.05	3.08	3.14	2.92	3.35	2.84	2.89	3.28	3.12
Pennsylvania (bituminous) .....	2.18	3.21	1.69	1.60	1.44	1.83	2.14	1.72	2.38	2.82	2.08
Tennessee .....	*	4.32	2.84	2.21	2.53	7.81	3.37	1.58	2.43	2.60	3.18
Utah .....	*	*	*	3.47	1.49	1.49	4.35	4.17	4.38	...	2.53
Washington .....	*	*	18.58	3.18	14.79	12.38	2.98	2.48	2.70	28.00	9.62
West Virginia .....	*	3.16	2.76	4.20	2.98	3.97	2.68	2.89	3.86	3.55	3.36
British Columbia .....	1.78	4.45	2.24	5.12	1.25	3.42	3.27	2.49	2.46	2.91	3.00
Nova Scotia .....	1.31	22.28	1.55	0.34	2.41	1.55	1.33	1.35	1.56	3.39	3.78
Total .....	2.43	3.30	2.51	2.46	2.47	2.63	2.78	2.31	2.54	2.99	2.64

\*No report.

It appears from this table that while the average rate for the decade has been 2.64 per 1,000, the highest rate is reported from Washington at 9.62 per 1,000, while the lowest rate is reported for Kentucky at 1.22 per 1,000. As has already been stated, the year 1899 had an average rate of 2.99 per 1,000, showing the highest record for the decade, excepting the year 1891, when the fatality rate reached 3.30 per 1,000.

For want of space it has not been possible to give the complete returns of the number of men employed in mining operations in all of the States and provinces included in the preceding tabulation, but a summary statement is given in the table below for the entire area under observation for the 10-year period 1890-1899, showing the number of men employed, the number killed and the corresponding fatality rate per 1,000:

## A Decade of Fatal Accidents in Coal Mining in North America, 1890-1899.

	No. of Employees.	No. killed.	Rate per 1,000.
1890 .....	288,205	701	2.43
1891 .....	325,840	1,076	3.30
1892 .....	342,744	859	2.51
1893 .....	374,017	919	2.46
1894 .....	377,626	934	2.47
1895 .....	387,303	1,020	2.63
1896 .....	391,990	1,091	2.78
1897 .....	393,025	909	2.31
1898 .....	395,553	1,004	2.54
1899 .....	401,868	1,200	2.99
<b>Total</b> .....	<b>3,678,171</b>	<b>9,713</b>	<b>2.64</b>

In a somewhat more convenient form the increase or decrease in the fatality rate during the past year is shown in comparison with the preceding 5-year period 1894-1898 in the table which follows:

## Fatal Accidents in Coal Mines in 1899, Compared with Five Previous Years, 1894-1898.

	No. of persons killed. yearly average.		Rate per 1,000 employed.		Increase or Decrease per 1,000.
	1894-'98.	1899.	1894-'98.	1899.	1899.
Colorado .....	34	41	4.83	5.60	+0.77
Illinois .....	74	84	2.21	2.27	+0.06
Indiana .....	22	16	2.84*	2.07	-0.77
Indian Territory .....	14	25	3.98	6.24	+2.26
Iowa .....	22	20	2.35	2.49	+0.14
Kansas .....	14	16	1.57	1.57	+0.00
Kentucky .....	8	7	1.05	0.83	-0.22
Maryland .....	6	5	1.50	1.08	-0.42
Missouri .....	13	14	1.84	1.80	-0.04
New Mexico .....	12	15	7.72*	7.98	+0.26
Ohio .....	46	57	1.56	2.03	+0.47
Pennsylvania (anthracite) ..	439	461	3.03	3.28	+0.25
Pennsylvania (bituminous) ..	161	258	1.88	2.82	+0.94
Tennessee .....	20	20	3.19	2.60	-0.59
Utah .....	2	..	3.20	....	-3.20
Washington .....	22	42	7.24	28.00	+20.76
West Virginia .....	72	89	3.27	3.55	+0.28
British Columbia .....	7	11	2.55	2.91	+0.36
Nova Scotia .....	9	19	1.64	3.39	+1.75
<b>Total</b> .....	<b>997</b>	<b>1,200</b>	<b>2.55</b>	<b>2.99</b>	<b>+0.44</b>

\*The data for Indiana and New Mexico are for the four-year period, 1895-1898.

It is shown by this table that the rate has increased in 12 States or provinces, while only 7 States show a decrease. The decrease has been largest in Utah, where no fatal accidents occurred during the entire year, in marked contrast to the terrible calamity which occurred in that State during the early part of the present year. The highest increase is reported for Indian Territory, Nova Scotia, Pennsylvania (bituminous), Colorado and Ohio, in the order named. The table shows that, for instance, in Pennsylvania in the bituminous region, where the average number of lives lost per annum has been 161 for the five years 1894-1898, the number of lives lost during the year 1899 was 258, equal to a corresponding increase in the rate per 1,000 from 1.88 to 2.82. It is quite clear from the tables which have been presented that the conditions affecting the coal mining industry during 1899 have not been favorable to a diminution of the fatal accident rate which it would seem reasonable to expect in view of the considerable extension of the State inspection system and the increased intelligence on the part of managers and employes as to the causes most productive of serious casualties. When it is taken into consideration that the average rates presented are merely an approximate indication of the dangers pertaining to the mining industry and that they are partly impaired by the fact that employment in coal mining is often for but two-thirds of the year, and that on the other hand no distinction is made as to employment inside or outside of the mine, the former being, of course, the much more dangerous occupation, it is quite plain that the coal mining industry must continue to be considered one of the most dangerous employments in the category of hazardous occupations. But it would be erroneous to conclude that the mining industry, as such, is to be considered much more dangerous than, for example, the railroad industry, as is shown by the following comparative table, giving the rates per 1,000 of men employed for both the coal mining and railroad industries of this country:



Fatal Accidents in Coal Mining and the Railroad Service.\*  
(Per 1,000 Persons Employed.)

	Coal Miners.	Railroad Employes.
1890 .....	2.43	3.27
1891 .....	3.30	3.39
1892 .....	2.51	3.11
1893 .....	2.46	3.12
1894 .....	2.47	2.34
1895 .....	2.63	2.31
1896 .....	2.78	2.25
1897 .....	2.31	2.06
1898 .....	2.54	2.24
1899 .....	2.99	2.38
Total .....	2.64	2.64

\*The coal mining accident rate is for North America; the railroad accident rate for the railroads of the United States reporting to the Interstate Commission.

It is a curious coincidence the average fatality rates are exactly the same for both occupations for the decade under consideration, and there would seem to be in many other respects a close analogy between the occurrence of fatal accidents in both occupations, since it appears that 1891 was the year showing the highest casualty rate in railroad management, as well as in the coal mining industry, while from 1891 to 1897 there is shown in both occupations a tendency toward a decline in the fatality rate. There appears in both occupations a strong indication toward an increased fatality rate during the past two years, but with this difference, that while previous to 1894 the railroad fatality rate was uniformly higher than the coal mining rate, since that year the fatality rate in coal mining operations has been without exception in excess of the fatality of railroad operations.

I can only repeat what I said in the "Engineering and Mining Journal" January 27th last, that "The very fact that more than 1,000 lives are lost every year in coal mining operations is sufficient to cause reflection and serious consideration of the point whether all reasonable precautions have been taken during recent years to

reduce this loss of life to a minimum. Looking at the returns for Kentucky it would seem that there is hope for a very material reduction in the accident liability of coal miners, and that in consequence of more efficient inspection, more careful instructions, more intelligent labor and improved methods of operations, the loss of life will be materially decreased during future years."

## DESCRIPTION OF "LINK-BELT" ELECTRIC CHAIN BREAST MACHINE.

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The principal parts of which this machine consists may be described as follows:

A stationary frame, A, is held to the floor of the mine by jacks, both front and rear, and presents on its upper surface two smooth rails or guides.

A motor is mounted on this frame and is capable of sliding along these guides, being driven forward and back by the sprockets, B, at the sides.

Attached to the motor is the sliding frame or chain guide, C.

The chain runs on the outside of this chain guide and carries bits set at different angles on its links. The angles at which these bits are set are such that the lowest of them just clears the floor upon which the machine stands, while the highest of them run about four inches above this, so as to cut a kerf in the coal of sufficient width for the sliding frame to enter after the bits. These bits are held in the chain by set screws, so that they can be quickly removed and changed when necessary, an operation which is pretty frequent in very heavy cutting.

The operation of the machine is then as follows:

The machine is unloaded near the face of the coal at the point where it is desired to make the cut with the forward bits just clearing the face. The rollers under the rear of the machine are set upon a guide, while the front of the machine stands directly upon the floor of the mine. The rear jack is set hard against the roof of the mine, while the front jack is set into the face of the coal. Two men are necessary for the operation of the machine. One of these, "the machine runner," stands by the motor and sets it in operation. The other, "the helper," stands at the face of the coal and shovels away the slack as fast as the chain delivers it to him.



From the description of the several parts of the machine above it will be seen that the train of gears driven by the motor performs two operations: It carries the cutter-chain with its bits around the guides or sliding frame, and simultaneously moves the motor and the sliding frame forward upon the stationary frame. The result of this is that the bits cut a kerf about 4 inches high and the full width of the cutter-head, back under the coal to a depth depending upon the length of the machine. As soon as the motor comes to the end of the stationary guides the forward feed is automatically stopped, the operator throws the reverse lever, D, and the motor travels backward, pulling the cutter-head out of the coal. By the time the machine is clear of the coal the two operators have the jacks loosened and are ready to slide it over and make another cut.

The time necessary for these operations is variable, depending upon the character of the coal and the style of feed used upon the machine. It generally takes from three to four minutes to make a forward cut, from 30 to 50 seconds to back out and under the best conditions about 45 seconds to move over and get ready to start on new cut. The number of cuts possible in a day will depend not only upon the above conditions, but also upon the width of the rooms, which determines how many times during the day the machine will have to be loaded upon a truck and hauled into a new room. About 25 to 35 cuts is an average day's work, while under very good conditions as high as 75 cuts have been made in one day of ten hours.

The power necessary for operation of these machines is variable. For operation of the motor and its train of gears alone about 10 amperes is required at 220 volts. With good clean coal, sharp bits and well lubricated bearings, 25 amperes is sufficient when the machine is in operation cutting coal. If the bits are not kept in condition, bearings are not cared for and especially if there are impurities in the coal, the necessary current will run up to 100 or 125 amperes.

**DANGEROUS ROOF OR "TOP" IN COAL MINING.**

*From Mines and Minerals, March, 1901.*

Even a cursory examination of almost any mine inspection report can not fail to impress one with the large number of accidents occurring from falls of roof and coal. Of this class of accidents fully 90 per cent. occur in close proximity to the working face. This is the portion of the mine that is more particularly under the charge of the miner and for which he is responsible in a large measure. It is true that it is the duty of the mine foreman or pit boss to see that each working place is maintained in a safe condition, but with the supply of needed timber and a few hurried instructions to the miner the responsibility of the mine foreman ends and the work of setting timber at the face devolves upon the miner himself.

Many a miner has lost his life through the neglect to perform this work promptly. Familiarity with the dangers of mining does not tend to make the miner a competent judge as to whether the setting of a few posts is an immediate necessity or whether it may not be delayed until he has loaded out the coal of the night before. It is human nature to postpone dead work, or work that brings no apparent remuneration, until an idle time, or at least to give preference to work that counts. The "sticking up of a post" is a matter of so little moment to the busy miner that it is in general regarded by him as something that can be done at any time. A few careless raps with the end of his drill upon the rock above him and he goes to work with little thought of the actual danger that threatens. In nine cases out of ten a stone must give a very hollow sound to cause the miner to delay his other work for even a few moments and set a few posts that would render his place safe beyond question. If these remarks are facts, and truly represent the attitude of the miner toward his surroundings, it is not strange that so many of these men meet death



in their working places and have no one to blame but their own negligence or procrastination.

To an unintelligent miner all kinds of roof are the same if they present a similar appearance. He knows little and seems to care less regarding the conditions that render a seemingly good roof "heavy;" he has no intelligent knowledge of the jointing in certain roof strata that renders such a roof extremely treacherous, and makes mining under it dangerous. He is wholly unconscious of conditions relative to the character of the roof strata above named, that make it possible for a thin roof slate or shale to settle away from a hard rock stratum above it. He is oblivious to the fact that above the thin stratum or roof there is forming an arch of rock that is supporting itself over a large area, and is liable at any moment to fall. He does not consider the circumstances that permit of a large increase of roof pressure due to an accumulation of water or gas above the roof slate. These, and many similar conditions by which the miner is continually surrounded, demand the closest study and consideration upon his part.

A dangerous roof is not always a weak roof or a roof that presents a broken and dangerous aspect to the view. One of the most dangerous roofs known to coal mining is that composed of a clod varying from 2 to 3 and at times 4 feet in thickness. This clod if allowed to fall in the rooms or chambers, would necessitate the handling of a large amount of dead material for which the miner would receive no pay, and his effort to hold it up during the life of his roof is only partially successful. This roof becomes, as a general rule, very heavy before the room is driven up half way. Under these circumstances the distance that it is safe to drive the room is much lessened. In many mining districts, particularly in those of the Central Basin, such conditions occur locally in the mine and render the working of certain rooms extremely dangerous, but since the trouble affects a few of the rooms only, the general plan is not changed, the miner in these cases being exposed to a danger which he does not realize. When this clod is thin and does not exceed, say, 12 or 18 inches, it is usually called a "dirt slate." In this case it is often an advantage



in the mining of thin seams, since the entries are driven up in the coal and are not timbered close to the face, thus giving the dirt slate an opportunity to fall, which it does a few yards behind the entryman at the face. The falling of this slate gives the required head room in the entry.

Certain kinds of roof strata contain joints, or slips as they are frequently called, that render the work of mining dangerous. Especially is this the case when the slips dip forward over the coal instead of rising. In this case the miner has no knowledge that he is working under a loose stone. At any moment his mining may loosen the coal that holds the forward end of this jointed slate and allow it to fall upon him without warning. When the slip runs in the opposite direction, or rises over the coal, the miner is warned of the danger, as he sees the slip before the slate is loosened.

In gaseous seams the settlement of the roof slate in the working of the coal vein permits the accumulation of a large body of gas above it. At times this gas is under considerable pressure, which adds to the weight of the roof and renders it more dangerous.

Much has been written and spoken in regard to systematic timbering as a means of averting the danger from falls of roof and coal to which the miner is daily exposed. There is no question but what systematic timbering is to be advocated in general mining practice, but as a means of averting danger we would suggest that a systematic time for timbering would be more effective. A good rule is that if timbering is needed at all it is needed at once, and not in an hour, or two hours, or to-morrow, and this rule adhered to would save more lives than any amount of system in the manner of placing timbers. In many kinds of roof, timbers must be placed where they are most needed; this is the case particularly in any form of broken, jointed roof. When boulders occur in the roof these require special timbers. In no case should the timber be set with the idea that it is to furnish a sufficient support to prevent the falling of the roof. When the depth of cover exceeds 100 yards no timbers can withstand the roof pressure which is liable to be thrown upon them.

Every experienced miner knows that the object of room timbers is to furnish temporary support in the immediate vicinity of the roadway and the working face. The timber furnishes further an important index of the movement of the roof, and the careful miner will not neglect to examine the timber in his room from time to time, to acquaint himself with the action of the roof. It should not be attempted to hold up the roof over any considerable area. If the roof has a tendency to fall let it fall in the gob and waste places. This will relieve the pressure upon the pillars and will be a benefit. Under stronger roofs this can not often be done, but the roof must be supported until the pillars are withdrawn, but in all cases a fall should then be induced. The writer recalls several instances when by neglecting to do this, and allowing the roof to stand supported over a considerable area, a squeeze or creep resulted that closed several pairs of entries. This is the natural result of the neglect to withdraw timber and induce a fall in the abandoned workings where the roof is strong.

In this connection a few words in regard to the manner of setting room timber will not be out of place. All room timber should be squared at both ends. It has been suggested by Mr. Hepplewhite that in hard roof and floor mine timbers should be tapered for a distance up from the bottom, greater or less, according to the character of the floor. By doing this the timber takes the weight gradually and is not broken as it otherwise would be; since the timber furs at the bottom. This is only another means of accomplishing the same thing as when a post is set upon an amount of soft compressible slack or dirt, since the same opportunity is thereby afforded for the timber to take the weight gradually as it is pressed into the soft dirt. This is an important factor and should always be borne in mind when setting room timber where the roof and floor are hard. The use of iron for wood in mine timbers has been tried in a few instances but has not proven satisfactory, because the iron when loaded by a weight greater than it can support breaks without warning. What renders mine timber the most efficient is the warning or evidence that it gives of the pressure upon it.



## THE BIG SANDY VALLEY.

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The mineral resources of this valley are attracting widespread interest, and have become the subjects of general inquiry, and the most active investigations. Their variety, extent and richness seem not to have been fully known, or credited, until the making of a survey of that section recently under the supervision of the United States Government. The work of the State Geological Survey, while embracing parts of this section, was far from complete, and therefore unsatisfactory, and while it disclosed much, and awakened great interest and stimulated further explorations and was the cause of many investments and the starting of numerous enterprises towards the development of these resources, yet their vastness, variety and value were not fully understood until the completion of this survey. It is proper to say that the expectations of the most sanguine have been more than realized and it is fair to predict that the next ten years will witness wonderful advancements in all this territory, both in population and material wealth, and it is hardly saying too much, when we express the belief that this and the other great mountain sections of the State are in the near future destined to exercise a mighty influence on all the business, social and political affairs of the Commonwealth.

Coal, iron, oil, gas, rock-asphalt, clays, building stone and timber in abundance are the best trade commodities, and draw capital and people of push and education, who plant business enterprises in all directions, until there follows a general diffusion of light and knowledge, and the whole country is soon awakened into new life and joins the procession of progress and prosperity. The one thing lacking is transportation. We believe these facilities will soon be provided, on land and on water, by the building of new railroad lines, and the making of river improvements.



As a means to this end, on the 3d of March, 1899, Congress appropriated \$52,500 for the better improvement of the Big Sandy river, and authorized the expenditure of as much as \$20,000 of this amount in a detailed survey of the entire valley, as a preliminary work, in order to justify the outlay in the way of a general improvement of the river, as it was expected that larger appropriations would follow in due course if the survey should disclose facts to justify the same.

The survey was required to be done under the directions of the Secretary of War, who committed the task to Capt. H. T. Hodges of the Corps of Engineers of the United States Army, and to B. F. Thomas, assistant engineer. These gentlemen appointed Prof. C. N. Brown, of the Ohio State University, to make the survey. As to his eminent ability to do the work, we quote from their report to Gen. John M. Wilson, Chief of Engineers, U. S. Army, and follow it with the report of said Brown in full (deeming it of great value and a most important addition to the geological literature of the State), which are as follows:

#### PROJECT FOR IMPROVEMENT.

*Recommendation.*—Maj. W. H. Bixby, Corps of Engineers, on April 27, 1898, reported in connection with the improvement of Big Sandy river as follows: "In my opinion, as well as that of my predecessors, Majors Lockwood and Gregory, the natural wealth of this river basin, with its enormous coal deposits as yet undeveloped through lack of proper transportation facilities, will thoroughly justify the thorough improvement of this river. Such thorough improvement, based on the experience already gained, will require 10 locks and dams on the Levisa Fork between Louisa and Pikeville, Ky., 8 locks and dams on the Tug Fork between Louisa and the mouth of Pond, and 3 locks and dams on the main river between Louisa and Catlettsburg, Ky.; 21 locks and dams in all. As proved by the work already done upon the one dam now completed at Louisa, the construction of such locks and dams will

involve no special engineering difficulties, if the funds be promptly provided therefor." (Ch. Eng. Rep. 1898, p. 2162.)

*Character.*—In the same report is the following:

"The dam already constructed on this river at Louisa is so satisfactory in all ways that it is proposed to adopt the same general plan of dam for the rest of the river, lowering its lift at the mouth of the river, but raising it, when practicable, at other places to 12 feet, and reserving moreover the right to modify the construction of its movable parts, as may later be found desirable, in order to keep up with the progress of invention between now and the date of actual future construction of these dams. \* \* \* \* It is proposed to give each of the new dams a height of from 12 to 18 feet, a navigable pass of 100 feet least width, and 6 feet least depth at the lower end of the river; a lift from pool to pool of from 6 to 12 feet; a lock of at least 255 feet total length, and at least 52 feet clear width (wide enough for two barges abreast), with a depth at least equal to that of the navigable pass; and a weir across the rest of the river rising 6 feet or less above the sill of the pass, so as to be entirely submerged at all high stages of river."

*Estimate of Cost.*—The cost, as estimated in the report referred to and quoted from, was given at an average of \$225,000 per dam for 21 dams, or a total of \$4,725,000 for the entire improvement. This contemplated an expense of about \$250,000 each at the lower parts of rivers and \$200,000 each at upper parts. Without the completion of the borings at the prospective sites, which, as has been stated, will be undertaken next season, it is not practicable to make a closer estimate than the general one given. It will be possible, in the final report, to give a much more reliable approximation of the cost than that heretofore given or now possible, for we will not only have better information as to the foundations of the various works, but also probably new contracts for locks below Louisa from which to determine prices, which have materially advanced since the preparation of the estimate above quoted.



## RESOURCES OF VALLEY

In order to ascertain from a reliable source the character and extent of the resources of the Big Sandy Valley, which, when developed, will furnish the traffic for slack-water navigation, it was decided to send into the field an experienced geologist and engineer, who could see for himself, and make report upon the mineral wealth as he saw it and as it had previously been presented in various reliable reports. Prof. C. N. Brown, of the Ohio State University, was selected for this purpose, because of his experience in coal-measure investigation. His report in full is appended hereto, and it is hoped that it will be published with all sections presented, as it is the only complete summarization of the mineral resources liable to be affected by the completion of a slack-water system in the Big Sandy and its tributaries, Levisa and Tug forks. This report shows in round numbers, at a most conservative estimate, 2,217,216,000 tons of coal, which may be expected to find an outlet by water transportation. This quantity would supply the entire trade now supplied by the Great Lakes for over two hundred years, or that shipped on the Ohio river from Pittsburgh for over three hundred years. It is difficult to estimate the extent of coal of workable thickness, but from the veins measured, and their position in the hills, and their great number, I am led to increase the quantities of Prof. Brown considerable in my estimate. I think it entirely safe to count on from 3,000,000,000 to 4,000,000,000 tons, with the chances greatly in favor of a considerable excess over the larger figures.

If this coal can be mined and shipped long distances over the Norfolk & Western and Chesapeake & Ohio railroads at a profit, it is not difficult to foresee its speedy and profitable development when a cheaper means of transportation is available.

Respectfully submitted,

CAPT. H. F. HODGES, Corps of Engineers, U. S. A.  
B. F. THOMAS, Assistant Engineer.



REPORT OF PROF. C. NEWTON BROWN UPON THE MINERAL WEALTH OF  
THE BIG SANDY VALLEY FROM LOUISA TO THE  
HEAD OF NAVIGATION.

The two branches of the Big Sandy river coming together at Louisa, Ky., drain an area of about 4,000 square miles lying in the States of Kentucky, West Virginia and Virginia. The Levisa Fork is the western and larger branch and its basin includes about 1,600 square miles in Kentucky and about 800 square miles in Virginia. The Tug Fork is the eastern branch and forms a part of the boundary line between Kentucky and West Virginia. It drains about 500 square miles in Kentucky, 700 square miles in Virginia and 400 square miles in West Virginia.

These streams are navigated by small steamboats, ranging from 20 to 137 tons burden, during the winter and spring, and by "push boats" during the summer and fall. The boats go to Fish Trap, the mouth of Russell Fork, on the Levisa Fork, or about 100 miles above Louisa. On the Tug Fork they go to the mouth of Sycamore creek, about 4 miles above Williamson, W. Va., and 61 miles above Louisa.

The area drained by these streams and their branches is rough and mountainous, and includes a part of the Cumberland Mountains. The valleys are usually quite narrow, giving very little land adapted to agriculture, and the hills or mountains rise from 200 feet to 1,500 or 1,600 feet above the streams. The area has had a dense growth of hardwood forest, including black walnut, poplar, oak, and other valuable and merchantable timber. Most of the timber near the main streams has been removed, but there is yet a very large amount of valuable timber that can be brought to market on these streams and will furnish employment to large numbers of men for many years to come.

The entire drainage basin of the Big Sandy river is included in the great Appalachian coal field, which extends from Pennsylvania to Alabama, and which includes the great coal and iron regions of Pennsylvania, Ohio, West Virginia, Kentucky, Virginia, Tennessee and Alabama.

Some of the minerals of great economic worth peculiar to this great Appalachian Basin are now known and worked in the Big Sandy Valley, and it is probable that others will be discovered in paying quantities as the region under consideration is prospected and developed.

The principal minerals of economic value and importance to be expected and sought for in this region are as follows: Coal, iron ore, clays, building materials, oil and gas, salt, glass sand, etc.

The coal is at present considered to be by far the most important and valuable of the minerals so far found or developed in the Big Sandy Valley, and the bulk of this report is devoted to that mineral. Before taking up the description of the coal field a short statement will be made of each of the other minerals observed in the valley.

#### IRON ORE.

The iron ores of the Big Sandy Valley have never been prospected or developed, except to a very slight extent, between the Levisa Fork and Tug Fork, near and along the old line of Chat-taroi railroad, now a branch of the Chesapeake & Ohio railway. Here a few veins were opened and some ore shipped to the blast furnaces at Ironton, Ohio and Ashland, Ky. But on account of the thin veins of ore and high freight rates on the railroads this ore could not compete with the great deposits of the Lake Superior region, and also of other parts of the Appalachian Basin, and the mining was therefore stopped at this place.

From direct observation and various reports the following statements can be made in regard to the iron ores of this valley:

Near Torch Light Station, and on Griffiths creek to the east of this station, a very nice looking block ore was seen that ranges from 12 to 14 inches thick, and also in the same locality a black band ore, ranging from 18 to 30 inches thick, was seen that had been worked in a small way. Analyses of these ores are given on page 206.

The following analyses of ores from the above-mentioned dis-



trict are taken from the Geological Survey of Kentucky, Chemical Report, Vol. A, part 3, page 183, 1888:

A. Limonite iron ore, from a bed at See Gap. A dense dark brown ore, coated and mixed with ocherous ore.

B. Iron ore. Yellow kidney. On Straight Creek fork of Three-mile Creek.

C. Iron ore. Limonite, irregularly cellular, with a little ocherous ore. From head of Three-mile Creek.

D. From same place as "C" and the same kind of ore.

E. Iron ore. Part of a nodule of dense limonite, with soft, ocherous material in interior. Wallbridge Station on Chattaroi railroad.

F. Iron ore. Brown limonite ore. Pecks Station. Griffiths creek.

G. Iron ore. Head of Griffiths creek. A dense, dark, reddish-brown limonite ore.

H. Iron ore. A very hard oolitic ore. From north of Louisa and not from the same district as the other ores of this list; said to be 3 feet thick.

The following analyses of black band ores from Lawrence county are taken from the Kentucky Geological Survey Chemical Report, Vol. A, page 280:

A. Black band ore, from near Louisa. Bed said to be from 12 to 16 inches thick and underlaid with 15 to 20 inches of bituminous shale.

B. Black band ore, from same locality as sample "A." From the Gavitt farm, on the West Fork of the Big Sandy river. A seam of coal from 4 to 6 feet thick just below it.

C. Average sample of black band ore on Levisa Fork of Big Sandy, 6 miles south of Louisa.



	A	B	C
Iron .....	33.26	33.92	25.75
Phosphorus .....			.553
Sulphur .....	.483		.354
Lime .....			.924
Magnesia .....			.150
Bituminous matters .....			13.700
Silica .....	7.460		6.360
Alumina .....			17.920

All of these ores are from Lawrence county, Ky., and are on the waters of the Big Sandy river.

	A.	B.	C.	D.	E.	F.	G.	H.
Iron peroxide . . . . .	45.48	52.47	54.19	63.81	57.03	64.88	54.51	60.79
Alumina . . . . .	9.53	9.78	17.42	9.44	6	6.79	15.15	7.77
Lime carbonate. . . . .	Trace	Trace	Trace	Trace	Trace	Trace	14.80	.60
Magnesia carbonate. . . . .	.38	Trace	.45	.08	.16	.15	2.05	.68
Phosphoric acid . . . . .	.64	.64	.51	.38	.51	3.33	.38	.38
Siliceous residue . . . . .	84	23.30	16	12.40	25.40	9.40	8.80	13.60
Water and loss . . . . .	9.98	13.86	11.43	14.38	10.90	16.01	9.31	16.18
Per cent of iron. . . . .	31.83	36.74	37.93	44.33	39.92	45.03	38.15	42.55
Per cent of phosphorous . .	.28	.28	.22	.17	.22	.93	.17	.17

On the head of Buffalo creek of Johns creek, in the western edge of Pike county on the land of Spencer Boyce, an iron ore has been opened, showing 28 inches of a fine looking red ore, soft and easily worked. The ore is about 500 feet above the creek, with about 250 feet of hill over the ore. The analysis is given below.

Also in the same locality on the lands of J. Harvey Leslie, on

Caney branch of Johns creek, Pike county, Ky., and about 3 miles due east of the ore deposit, on the Boyce land, another ore deposit had been quite well prospected. The ore is 115 feet above the creek with several hundred feet of hill above it. The ore is quite irregular in thickness where prospected, ranging from nothing to 4 feet in a few hundred feet. The analysis is given below.

On the land of Jefferson Robinson, on Arkansas or Layne branch of the Left Fork of Beaver creek, Floyd county, Ky., about 9 miles due south of Prestonsburg, an iron ore shows in a "rock house" under a thick ledge of sandstone. It is also quite irregular in thickness, showing 3 feet at one place, running some feet 12 and 16 inches thick, and then cutting out in a few feet farther. The analysis is given below.

The following analyses are taken from the Kentucky Geological Survey Reports: "A" and "B" from Chemical Report, Vol. A, part 3, page 188; "C" from Chemical Report, Vol. A, part 3, page 174, and "D" from Chemical Report, Vol. A, part 2, page 232:

A. Iron ore from Buffalo creek.

B. Iron ore from Caney creek.

C. Iron ore from Beaver creek.

D. Iron ore from land of Levi Potter, on Elkhorn creek, Pike county, Ky., 16 miles from mouth of creek, about 150 feet above creek. Occurs in large blocks. See Kentucky Geological Reports, "Report on the Pound Gap region," page 13.

	A	B	C	D
Iron peroxide .....	70.42	58.84	55.53	59.63
Alumina .....	9.54	16.63	10.57	7.93
Lime carbonate .....	.50	1.20	12.10	.....
Magnesia carbonate .....	.23	.61	2.50	.....
Phosphoric acid .....	1.28	2.18	2.05	.56
Siliceous residue .....	1.20	4.60	5.	29.73
Water, etc., and loss .....	16.83	15.96	12.26	2.16
Per cent. of iron .....	49.30	41.18	38.87	41.74
Per cent. of phosphorus .....	.87	1.49	.89	.23

The Kentucky Geological Survey in its report on the Pound Gap region, page 11, etc., makes the following statements in regard to iron ores on Elkhorn creek and vicinity, in the eastern part of Pike county: "Two regular iron-ore horizons are brought above the drainage by the Pine Mountain uplift; the same that are exposed by the cutting away of the overlying rocks along the front of the Cumberland Mountain. \* \* \* Not much is known of the thickness and persistency of this ore in the Pound Gap region, as it is usually covered by the soil and mingled fragments of rock which cover the face of the mountain to a considerable depth.

"It is seen at many points in a weathered state upon the surface, sometimes, as at the head of Pigeonroost branch and of Toms branch of Elkhorn creek, in a spur of Pine Mountain, it is exposed in great profusion over the surface.

"The quality of the ore is not inferior to that of Estill and Menifee counties. Whether it is thick enough for profitable mining, dipping as it does into the face of the hill, is a question to be settled by practical tests. The surface indications are favorable but could not be held as conclusive, except as to the equivalency and uniform good quality of the ore.

"The upper silurian or dyestone ore, may, with reasonable certainty, be assumed to occupy its regular place in the beds at the foot of the mountain. \* \* \* In this region it is everywhere covered by the abutting coal-measure rocks, or by the talus from the ledges of overlying rocks. \* \* \* Along the face of the Cumberland Mountain none of these conditions stand in the way of a study of the ore, which occurs in several beds, or interferes with the ready mining at many points for north and south.

"On Elkhorn creek another ore occurs which does not belong to the Pine Mountain series; but as it is a local deposit along the face of the mountain, it may properly be described in this connection. This bed has the character of a recent deposit, though its occurrence at many points along the valley on both sides of the creek at the same horizon, apparently, and the similarity of



the arrangement of the parts of the bed at widely separated exposures, makes it appear like a continuous bed. It is made up of from 1 to 3 feet of anhydrous sesquioxide of iron, including many fragments of sand rock and siliceous shale, the latter apparently greatly changed by heat. The ore is also in part blistered and porous, as though through the agency of heat. Resting on this there is generally found from 1 to 2 feet of earthy ore, or red ochre, with small fragments of siliceous rock intermingled. In general the lower part includes too great a proportion of siliceous material in the form of fragments of sand rock to be valuable. In places, as noted near Levi Potter's, it will probably be found to be comparatively free from these objectionable features. (An analysis of this ore is given above as sample D.) It is probable that this ore is a 'rim' deposit, but nothing has been noted which explains its occurrence at this particular horizon; and the appearance of metamorphosis can not be readily explained from the data at hand. \* \* \* The most that can be said for this ore is that it is probable that it may prove valuable as an iron ore locally, and generally as a source of red ochre. It is exposed along the Elkhorn Valley from near the mouth of Sycamore creek, of Elkhorn, toward the head for 6 miles or more. On Pigeonroost branch of Elkhorn it is 285 feet above the main creek. On Harvey Gibson's land, opposite side of the valley, about the same level, it is relatively lower up the creek, being 150 feet above the main drainage at Levi Potter's."

#### CLAY.

No attention had been given the clays of this valley beyond an occasional use for ordinary building brick. The stratified clays have not been prospected or sought for as in other parts of the great Appalachian coal basin. A few good samples of a plastic fire clay were seen at two places in the area examined. It is very probable that workable deposits of valuable clays will be found as the country is developed. It is to be expected that clays suitable for the various grades of fire brick and pressed building brick,

sewer pipe, and for the manufacture of Portland cement, will be found in the coal-measures exposed in the Big Sandy Valley.

#### BUILDING MATERIALS.

There is a great abundance of rather coarse-grained sandstone of good quality that will be valuable for the buildings and masonry structures necessary in river improvements, railroads, mine buildings, and manufacturing establishments.

Clay for ordinary building brick is found in quantity and quality suitable for all ordinary brick structures.

Limestone was found at only one locality. The Pine Mountain, forming a part of the boundary line between Kentucky and Virginia, and lying between Elkhorn creek and Pound river, branches of Russell Fork of the Levisa Fork, has a bed of fine-grained, solid, non-fossiliferous white limestone from 200 to 300 feet thick lying about 1,000 feet above the main stream. This will supply a fine quality of lime to all this region for building and manufacturing purposes as soon as some means of transportation is secured. This limestone, together with some of the clays or clay shales of this region, ought to make a good quality of Portland cement.

#### OIL AND GAS.

Oil is now being developed in the Big Sandy Valley and paying quantities have been found at several places. The persons doing the work have not completed their investigations, and are therefore not at present making public all the information they have gathered. The drilling is being pushed rapidly at many places, and the natural inference is that the results are satisfactory or the work would not have been continued for over two years, as it has been. On Beaver creek, Floyd county, Ky., about 14 miles nearly due south of Prestonburg, a few wells are now producing oil in paying quantities, and two tanks of about 15,000 gallons each have been erected to store the oil until some means of transportation can be provided.

Gas has been known on the Tug Fork, at and near Warfield,



Martin county, Ky., for many years, and within the last two years it has been piped to the towns along the Ohio river. At Warfield the gas is also now used for making a high grade of lampblack.

The oil wells being drilled in Floyd and Pike counties, Ky., also develop considerable gas, although they are located with a view of not striking the gas.

It is quite probable that extensive oil and gas fields will be found in this part of the Big Sandy Valley. While the oil and gas will be transported through pipe lines, and so furnish no direct traffic on the river in this way, the large quantities of supplies, machinery, etc., necessary for drilling and for handling the oil and gas would seek the cheaper water transportation if it were provided.

#### SALT.

Many years ago salt was manufactured in considerable quantities at several places in this valley, the most important, probably, being at Warfield, Martin county, Ky., where the old works can still be seen.

Many of the oil and gas wells now being drilled throw out large quantities of salt water that could be utilized for salt making under favorable circumstances. For fuel either the gas or some of the many coals so liberally scattered through this country could be used. It is probable that cheap water transportation would revive some of the old salt works of this valley.

#### OTHER MINERALS.

It is possible that there are other minerals which may be found in such quality and quantity as should warrant their working in a large way so as to furnish traffic on the river, but not enough is known of them to permit any positive statements being made in regard to them at this time.

The remainder of this report will be devoted to a description of the coals seen on a trip through the country and to a compilation



of matter from the Kentucky Geological Survey Reports and other reports treating of this district

#### COAL.

The coal of the Big Sandy Valley has attracted much attention from persons engaged in coal mining and business and from persons seeking a fuel suitable for iron manufacture or other special issues.

The Norfolk & Western railroad has opened up that portion of the field along the upper part of the Tug Fork, and the "Thacker" coal and the "Pocahontas" coal and coke have attained a high rank in the markets of the North and Northwest.

The building of the Norfolk & Western railroad along the upper part of the Tug Fork has caused that district to be fairly well prospected, and the coals are now pretty well known along that valley. It has also brought a large number of people into the region who are acquainted with the geology of a coal region and who are quick to notice signs of coal, and who can intelligently note and report any openings that are made into the various coals.

Along the Levisa Fork above Peach Orchard there is no means of shipping coal and no mines of any size. The only openings are those for the local supply, which are usually made near the foot of the hill or mountain in the most convenient place, without regard to what better coals may be found higher in the hill. In many locations the people burn only wood, which is very abundant, and so know nothing of the coals except as they may be accidentally exposed in a landslide, at the roots of an overturned tree, or in a rock house. In a number of places outside capitalists have bought up large tracts of land for the coal, and in such places the lands have been very well prospected, and the large companies usually know pretty well what they own in the way of coal. When the representatives of these companies could be found and consulted much valuable information was obtained, every one placing their notes and maps at my disposal and helping me in every possible way in the collection of information.

In the Big Sandy Valley several varieties of soft or bituminous coal are found in great abundance and fine quality. The principal varieties that carry independent names are splint coal, cannel coal, gas coal, coking coal, steam coal.

Splint coal is usually a rather hard coal that will not break into small pieces when handled or shipped. It has a rather dull appearance and has been sometimes mistaken for an impurity called "bone coal" by persons not acquainted with it. It makes a good coal for domestic use and for locomotives and hand-stoked steam boilers. It ships well and stocks well, two very important properties in a coal that is to go into the general markets.

Cannel coal is used for domestic grate fires and gas making. It mines in large blocks, usually as thick as the full bed of coal. It always commands a very high price in the large city markets. The coal is always found in limited areas called "pockets" or "pools." These "pockets" may have an extent of only a few acres or of several square miles. Two mines are now being worked in this coal in Johnson County, Ky., on the Levisa Fork, and the product bears a good name in the general markets. The coal from these mines is shipped to points in both New York and Texas.

Steam coal is the name applied to any coal well adapted to use under steam boilers. The same coal may also make a good domestic coal or gas coal. There is usually no objection to small or fine coal for steam making, and in machine-stoked boilers it is desirable. A steam coal must not form clinkers on the grate bars of the fire box or furnace, and should have low percentages of ash and sulphur.

Gas coal is a name applied to any coal that is well suited for making a good quality of illuminating gas. It should have a high percentage of volatile combustible matter and a low percentage of sulphur. The same coal can be and is used for many other purposes.

Coking coal is a name applied to bituminous coals with a low percentage of volatile combustible matter and with a high percentage of fixed carbon. A low percentage of ash and sulphur



are very desirable. This coal is used for making coke for use as a fuel in blast furnaces and other iron-working furnaces. The same coal may be used for domestic and steam use. It usually mines in small lumps, and is a rather weak coal.

In the valleys of the Tug and Levisa forks the coking coal is mostly found in the eastern portion and the splint and cannel coals in the western portion and northern portion, although exceptions are found to both of these statements. No sharp dividing line can be drawn, and the two or three varieties may be found in the same hill, but the present knowledge of the area indicates the above general distribution. For ease of description the basin of each fork will be taken up separately and then described by counties and creeks.

In order to form some idea of the total possible traffic that the coal of the Big Sandy Valley may furnish to the river when improved and railroads when built, estimates of the total tonnage of coal will be made, but it must be remembered that any statements as to the quantity of coal that may be obtained from any particular large area of this valley must of necessity be rough estimates, on account of the lack of accurate data as to the areas and thickness of the various veins.

In making the estimates that will be given hereafter every precaution will be taken to make them conservative and less than the general belief of those persons best able to judge the matter from a thorough acquaintance with the valley. Some of the companies holding large areas of the coal lands have had a few surveys made of the crop lines of the principal veins on their lands and these have been made use of. The topographical contour maps made by the United States Geological Survey were studied on the ground and other notes taken from observations made during an extended tour of the valley.

It will be estimated that 1,000 tons of 2,000 pounds each can be shipped for each foot of thickness from each acre. This is to include the total shipment of coal, including lump, nut, and pea coal. This allows for about 700 tons per foot per acre to be lost in ribs

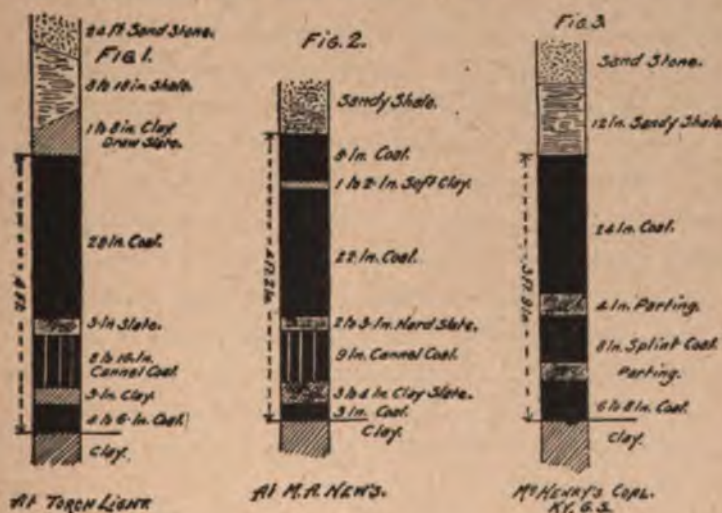


and pillars and in "faults" and "horse backs." In many mines 1,200 tons of lump coal besides the nut and pea coal is shipped from each acre for each foot of thickness of clean coal.

The above assumptions give 640,000 net tons (2,000 pounds) for each foot of thickness for each square mile, and this number will be used in the estimates made below.

#### LEVISA FORK.

*Laurence County, Ky., Torch Light and McHenry's coal.*—Going south from Louisa, Ky., at the junction of the Tug and Levisa forks, and up the Levisa Fork, the first coal of workable thickness, so far as known, is found at Torch Light Station, on the Chesapeake & Ohio railroad, about 6 miles from Louisa. There is a



small mine working here and shipping coal on the railroad, and it is fitted for shipping on the river. The coal lies about 160 feet above the river, and has from 200 to 400 feet of hill over it. The coal is found on both sides of the river, and also across the ridge to the west, on the upper part of Lick Creek. The coal dips strongly to the north, about 50 to 60 feet per mile, both on the river and Lick Creek, and soon goes below drainage. It also seems to thin out to the north, so far as visible.

The coal bed has a thin layer of cannel coal, about 8 to 10 inches, near the bottom of the bed, which is not separated from the bituminous coal when shipped it being left in to increase the value of the coal for domestic use. The coal has a good reputation as a domestic coal, but it is not so well liked as a steam coal.

The Kentucky Geological Survey calls this the McHenry coal, designates it as the No. 3 coal, or the equivalent of the Peach Orchard coal mentioned below. (Vol. C, p. 68, pl. 31.) See figs. 1 and 2 for structure of this coal bed.

The Kentucky Geological Survey, pl. 31, Vol. C., gives the section of the McHenry coal shown in fig. 3. It is opened in the immediate vicinity of Torch Light. The analysis of the McHenry coal is given in the table below, as sample D.

About 80 feet above the coal shown in figs. 1, 2, and 3 coal has been opened and is reported as being 6 feet thick, but full of thin clay partings. The openings have fallen in, so that no measurements could be made at present.

The coal shown in figs. 1, 2, and 3 is open at several places up the river toward Peach Orchard.

*Georges Creek.*—This is a large stream coming into the river from the west, between Torch Light and Peach Orchard. Near the hilltops along the lower part of the creek the Peach Orchard coal is reported as having nearly the same thickness as at the Peach Orchard mines, but no openings were seen where measurements could be made.

About Lomansville, on the upper part of the creek and near the county line, between Lawrence and Johnson counties, the No. 1 coal is opened and worked near the creek level. It has here an average thickness of 36 inches and rises in places to nearly 5 feet. There are many places where it can be worked to advantage on this creek. (Kentucky Geological Survey, part 5, vol. 6, second series, p. 12.)

*Nats Creek and Peach Orchard.*—Just below the mouth of Nats Creek coal was mined and shipped in barges on the river for several years some forty years ago. It was discontinued on account



of the great loss of boats on snags and rocks and because there was no water for several months during the summer. In 1881 the Chattaroi railroad was completed to this point and a large mine opened on Nats Creek, about 3 miles from the river. It was equipped with all the modern improvements for mining and handling coal and has been shipping about 55,000 tons of coal per year.

The Peach Orchard coal lies about 200 feet above the river, and the ridges rise about 400 feet above the coal. There is a large area of this coal between the Levisa Fork and Rock Castle Creek, covering at least 60 per cent. of the total area between the two streams.

The coal has a good reputation as a domestic and steam coal. Its thickness and structure are shown in figs. 4 and 5, and the analysis is given in the table below.

A. Peach Orchard coal. From Annual Report of Inspector of Mines of Kentucky for 1895, page 226.

B. Peach Orchard coal. From Kentucky Geological Survey, Vol. C, p. 18.

C. Coke from Peach Orchard coal. From Kentucky Geological Survey, Chemical Report, Vol. A, part 2, p. 205.

D. McHenry coal. From Kentucky Geological Survey, Vol. C, p. 18.

	A	B	C	D
Moisture .....	3.36	3.24	5.10	4.60
Volatile combustible matter .....	37.05	36.56	.90	35.70
Fixed carbon .....	52.82	54.95	90.06	53.28
Ash .....	5.55	5.24	3.94	6.42
Sulphur .....	1.22	1.19	.82	1.08

The owners of the Peach Orchard mines and also the Kentucky Geological Survey, part 5, Vol. 6, p. 21, mention two workable coals on Nats creek, above the level of the Peach Orchard coal, but no openings into them were now open.



To the south of the mouth of Nats creek about two miles another vein of coal, reported to be from 4 to 5 feet thick, lies at the level of the river, and is at times dug to supply coal to the

*Peach Orchard Coal.*

FIG. 4.  
From Kentucky Geol. Survey  
Vol. C. Plate 31.



FIG. 5.  
From Superintendent of Mines  
July 1889.



small river steamers. This is probably the No. 1 coal of the Kentucky Geological Survey, which is so well and so favorably known all along the river from this place almost to Pikeville, Ky.

*Quantity of Coal in Lawrence County, Ky., on the Levisa Fork.*—The estimated area bearing workable coal in the hills is 96 square miles. The area furnishing 3 feet of clean merchantable coal is estimated at 30 per cent. of the 96 square miles, or 28.8 square miles. 28.8 square miles, at 640,000 tons per foot per square mile, gives 55,296,000 tons.

*Johnson County, Ky.—White House Creek.*—This creek enters the Levisa Fork from the east on the north edge of Johnson county, Ky. At its mouth is located a village of the same name, the terminus of the Chesapeake & Ohio Railroad, and a cannel coal mine that has been shipping cannel coal on the railroad for over

ten years. These mines have nearly exhausted the deposit of cannel coal at this place and expect to remove to another location in a short time. They have shipped from 5,000 to 10,000 net tons of cannel coal per year. The cannel coal has averaged about 20 inches thick, and in some places ran for 24 and 26 inches over considerable areas. There is a variable amount of soft coal with the cannel sufficient to bring the entire vein up to 30 and 36 inches thick.

The Kentucky Geological Survey Chemical Report, Vol. A, part 3, page 181, gives the following analysis of this coal; also in Vol. A, part 1, page 275:

Moisture .....	1.20	2.00
Volatile combustible matter .....	41.80	38.20
Fixed carbon .....	46.00	51.00
Ash .....	11.	8.80
Sulphur .....	.96	.956

On White House Creek the following section of the hill was measured:

	Feet above river.
Top of hills .....	650
12-foot coal (level of low gaps) .....	470
4-foot coal .....	425
3-foot coal .....	360
Cannel coal .....	90

The opening into the "3-foot" coal had fallen in, so that no measurement could be made. The thickness and structure of the "4-foot" coal is shown in fig. 6, and the thickness and structure of the "12-foot" coal is shown in fig 7. Both coals were well opened and shown.

The "12-foot" coal is found and has been opened at several places along the high ridge from this place, at the head of White House creek, south for about 15 miles to the high ground be-

tween Johns creek and the heads of Wolf creek and the Middle Fork of Rock Castle creek. From this latter place to the south and east it is not recognized and either runs above the hilltops or

FIG. 6.



FIG. 7.





the partings thicken up and make a number of thin veins instead of one, so that it has not been identified.

*Coal No. 1 in Johnson County, Ky.*—This coal has a wide development in this county, and because of its being near the stream levels has been very generally opened, by the people for local use. It varies from 30 to 50 inches in thickness and is ordinarily known as the 4-foot coal. The following statements are partly from my own observations and partly from the Kentucky Geological Reports, part 5, Vol. 6, second series.

On the upper part of Georges creek, in this county, the No. 1



coal averages 36 inches thick, and on Toms creek it runs from 36 to 42 inches, all solid clean coal, with no partings, and on both creeks it is low in the hills.

Around Paintsville, the county seat of Johnson county, it is usually over 4 feet thick, with no partings, and often reaches 5 feet, and about 100 feet above the river. See figs. 8 and 9. Two miles up Paint creek, west of Levisa Fork, it shows full 4 feet, and on Lick Fork of Jennys creek, on west of Levisa Fork, and on Little Paint creek of Levisa Fork, on the west, it ranges from 36 to 48 inches in thickness and lies near the high-water mark.

On Greasy creek, on the east of Levisa Fork, this coal lies low in the hills and ranges from 3 to 4 feet thick, of a solid clean coal with a good roof and no partings.

On Buffalo creek, also on the east of Levisa Fork, it measures from 40 to 48 inches thick with the same character as on Greasy creek. For several miles on this creek it is not over 40 feet above high-water mark.

On Millers creek, east of Levisa Fork, it lies very low and seldom runs less than 4 feet thick, more frequently reaching 5 feet, and has the same character as above-mentioned. (See fig. 10.)



On Daniels creek, east of Levisa Fork, the coal averages very nearly 50 inches thick and is very near the high-water mark for several miles along the creek.

Along the lower part of Johns creek the coal lies below the high-water mark and averages about 52 inches thick. (See fig. 11.)

In all this area the coal is without partings and as a rule has a good shale roof. It is usually from one-third to two-thirds of a good quality of splint coal. The remainder is of a splinty nature, but it is ranked as ordinary bituminous coal.

This No. 1 coal covers a large percentage of Johnson county, because wherever the streams cut deep enough the coal is found and is seldom less than 3 feet thick.



The following analyses and sections give the composition and details of structure of the coal at a number of places. The sections are all measured for this report. (See figs. 8, 9, 10 and 11.)

Analyses of the No. 1 coal in Johnson county, Ky., from the Kentucky Geological Survey Reports, part 5, Vol. 6, p. 13:

- A. From Smiths branch of Paint creek.
- B. From Wheeler's bank, near Paintsville.
- C. From Rice's bank, on head of Jennys creek.

	A	B	C
Moisture .....	2.90	2.66	3.10
Volatile combustible matter .....	39.10	38.04	38.68
Fixed carbon .....	51.34	56.30	53.50
Ash .....	6.66	3.	4.80
Sulphur .....	4.53	1.29	1.74

This coal mines in large lumps and stands handling and stocking very well. It is a fine domestic and steam coal.

#### CANNEL COALS OF JOHNSON COUNTY, KY.

The cannel coals of Johnson county, Ky., have attracted much attention from coal operators and have been quite well prospected and explored in some localities. Cannel coal is mined in a large way for the railroad markets in two places in this county, viz., at White House and on Greasy creek, on the east side of the Levisa Fork and about 8 miles south of White House, and the terminus of the railroad. The coal company on Greasy creek has built a tramroad at great expense from their mines to the railroad.

The cannel coal has been found on Millers creek and Daniels creek on the east of the Levisa Fork, and on Toms creek, Jennys creek and Lick Fork on the west side of the Levisa Fork. Much of the coal land on the above-named creeks is now owned by large companies, who expect to develop the coal and open mines as soon as some reliable means of transportation is provided.



The cannel-coal horizon is continuous, and from 3 to 5 feet of coal of some character is found at all places where it has been sought for properly; but, as is to be expected, the cannel coal itself is not continuous, but is at times replaced, in whole or in part, by ordinary bituminous coal or splint coal, or a mixture of them; but the cannel coal is found at so many places in good



thickness that there is no doubt but that this region contains many large and valuable deposits of cannel coal that will sustain large workings in the future. Large areas are found that show a thickness of cannel coal from 18 inches to 26 inches, with a variable amount of bituminous and splint coal to make a total vein of from 3 to 5 feet. In the southern edge of this county at Eastpoint, on the county line between Johnson and Floyd counties, and about one-half mile west of the Levisa Fork, this cannel coal assumes a very unusual thickness of 51 inches. Fig. 12 shows the measured section of the Eastpoint coal. Fig. 13 was measured in Wells hollow of Daniels creek, and shows an average section of a large area in that locality.

The cannel coal usually lies well up the hill along the main

streams, as it is from 100 to 200 feet above the No. 1 coal described above.

The following analyses shows the composition of the cannel coals of this region: Samples A, B, C and D were obtained from the reports of expert engineers employed by the various coal companies. All the others were taken from the reports of the Kentucky Geological Survey, as follows: E from "A preliminary report on Morgan, Johnson and other counties," p. 15. F, G and H from Chemical Report, Vol. A, part 3, p. 62.

A. } Top of vein. }  
 B. } Eastpoint cannel coal.  
 C. Bottom of vein. }

D. From ridge between Buffalo and Greasy creeks.

E. From Lick branch, Johnson county.

F. From Smiths branch of Paint creek; 18 inches of cannel coal, overlaid with 18 inches of common coal; samples from cannel coal.

G. From 22 inches of cannel coal on W. T. Hager's land, 1 mile north of the mouth of Little Paint creek.

H. From the lower 8 inches of sample G.

I. From Walter Fletcher's land on Little Paint creek. Cannel coal from the upper 22 inches of the 43-inch bed.

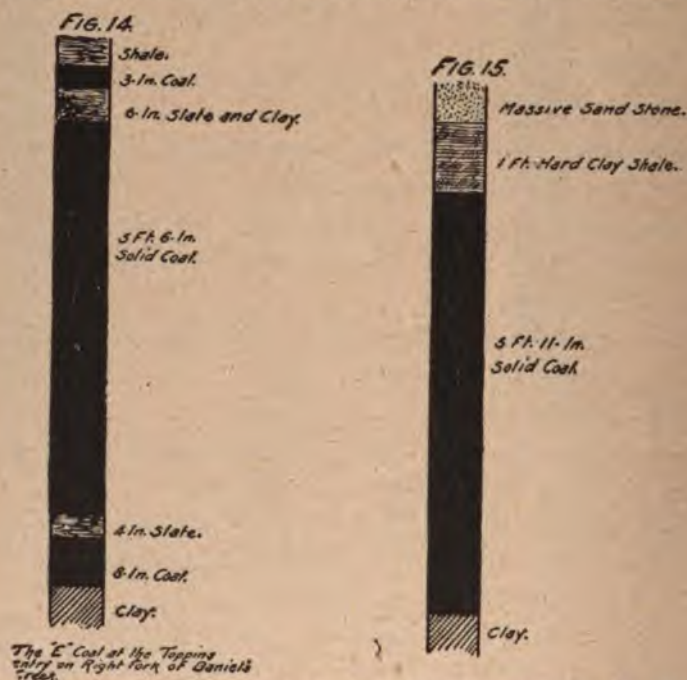
J. From same place as sample I, but is the lower 21 inches of the 43-inch bed and is a splint or bituminous coal.

	A	B	C	D	E	F	G	H	I	J
Moisture .....	0.56	0.78	1.20	55.88	2.	3.	1.80.	1.80	1.44	2.56
Volatile matter	59.99	46.83	64.39	55.98	38.20	49.80	49.10	49.20	50.22	39.94
Fixed carbon .	31.71	33.46	26.36	35.75	51.	37.94	41.16	44.	40.74	54.10
Ash .....	7.72	8.91	8.05	8.37	8.80	9.26	7.94	5.	7.60	3.40
Sulphur .....	1.25	1.35	1.67	.....	.956	2.609	.816	.846	.837	1.030
Phosphorus ..	.011	.009	.010	.....	.....	.....	.....	.....	.....	.....
Specific gravity	.....	.....	.....	.....	1.291	1.279	1.248	1.223	1.242	1.275



## OTHER COALS OF JOHNSON COUNTY, KY.

Besides the No. 1 coal and the cannel coals described above, there are at least three other coals of workable thickness in parts of this county. In the eastern part of the county, on the heads of Daniels creek, Millers creek, Buffalo creek and Greasy creek, the southern extension of the Peach Orchard coal is found, with a thickness ranging from 8 to 11 feet, and is commonly known as the "10-foot" seam. In this county it has so far shown quite



a number of thin slate partings that will discourage its working until the better coals have been pretty well worked out. (See fig. 16.)

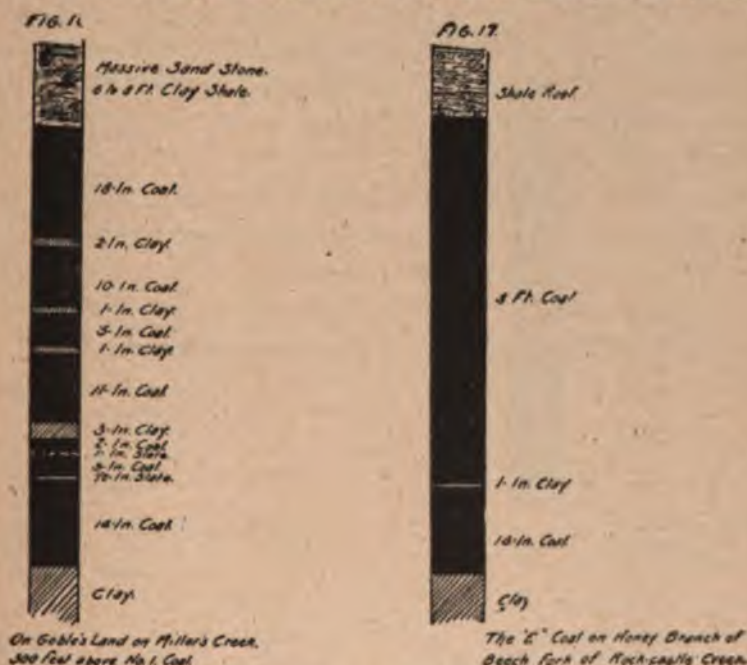
From 65 to 80 feet above the Peach Orchard coal is a fine coal commonly known as the "6-foot" coal and locally as the E coal, and from 135 to 160 feet above the E coal is the F vein, which is the same as described above as the "12-foot" coal vein on White House creek, and shown in fig. 7. No measurement of this big coal could be obtained in this region, but it was reported by reliable



persons as being very like the section shown in fig. 7. It is near the hilltops, and is now considered to be of very little economical value.

On the head of the right fork of Daniels creek, at the "Top-pins" entry on the Simpkins' land, the E coal was measured as shown in fig. 14. (See fig. 17.)

On George Goble's land, on the head of Millers creek, the E



coal is 440 feet above the No. 1 coal in the creek bed, and has the section shown in fig. 15.

Also in George Goble's land a coal about 300 feet above the No. 1 coal, and believed to be the representative of the Peach Orchard coal has the section shown in fig. 16. It is claimed by persons who have opened this coal at other places that the three small clay partings in the upper part are not continuous.

Little or no prospecting has been done in the high ground in the southwestern part of Johnson county, so that it is not known whether these upper coals hold their thickness in this area or not.

but it is reasonable to assume that at least one of them will be of workable thickness.

#### QUANTITY OF COAL IN JOHNSON COUNTY, KY.

The following estimate is offered as a conservative statement of the probable amount of the most available coal of the county. No. 1 coal is estimated to average 3 feet 8 inches thick over 50 per cent. of the county.

The cannel coal is estimated to average 3 feet thick over 10 per cent. of the county (including the bituminous coal of the vein.)

Peach Orchard coal is not estimated on account of the large number of slate partings in it.

The E coal is estimated to average 5 feet thick over an area in the eastern part of the county 4 miles wide and 10 miles long.

The F coal is not estimated on account of the partings and because of its high position in the hills and the small acreage.

The above estimate gives the following quantities:

	Square miles	Tons
No. 1 coal .....	135	316,800,000
Cannel coals .....	27	51,840,000
The E coal .....	16	51,200,000
Total for Johnson County .....		419,840,000

#### FLOYD COUNTY, KY.

Floyd county, Ky., lies on both sides of the Levisa Fork, south of Johnson county and northwest of Pike county, Ky. The larger part of the county lies on the southwest side of the river and is drained by Little Paint, Abbotts, Middle, Bull, Beaver, Prator and Mud creeks, all tributaries of the Levisa Fork on the west side. That part of the county to the east of the river is drained by Johns creek and its branch, Buffalo creek, and by Cow, Ivy and Mare creeks, emptying directly into the river from the east.

*Coal No. 1.*—The No. 1 coal of the Kentucky Geological Survey



extends into this county from Johnson county and is widely distributed through this county and is often known as the Prestonburg coal.

At the mouth of Little Paint creek and of Johns creek the coal lies near the level of high water, and averages about 4 feet 4 inches thick. (See fig. 18.)

At Hatcher's, at the mouth of Abbotts creek, it is 4 feet 8 inches thick and at high-water level. (See fig. 19.)

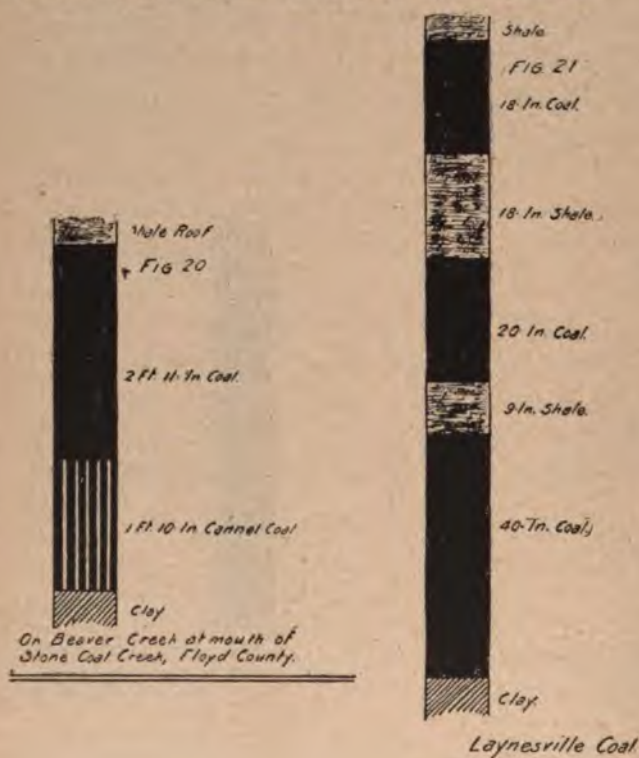


At both the last-named places it is a clean, solid coal without partings. On the head waters of Abbotts creek the coal thins out to about 3 feet or 3 feet 6 inches.

At Harris' bank, near Prestonburg, it shows 44 inches at about 100 feet above the river level. At Fitzpatrick's bank, about 3 miles up Middle creek, it is only 3 feet thick and at the creek level; it is reported to hold its thickness for a considerable distance up Middle creek. On Bull creek it is opened for local use, and is reported as about 4 feet 6 inches thick. On Beaver creek this coal lies low and has a thickness ranging from 3 to 5 feet, the maximum being found on the right fork of Beaver creek from the mouth of Rocky Fork to Caney creek, and including portions



of the valleys of all the tributaries between. At the mouth of Stone Coal branch of the right fork of Beaver creek the No. 1 coal has some cannel coal in it, but it is thought that the pocket of cannel coal is of small extent. (See fig. 20.)



Figures 21, 23, & 25 are taken from  
the Kentucky Geological Reports.

A coal of considerable thickness has been dug out of the river bed a short distance above the mouth of Prator creek, and also about the mouth of Ivy creek, which is probably the No. 1 coal.

The coal about Laynesville and the mouth of Mud creek is usually assigned to the horizon of the No. 1 coal, although this coal has a large clay parting in the central portion, and the No. 1 coal has been characterized by having no partings, at all points to the north down the river.

The geology of this region has not been thoroughly worked out and the complete section not yet determined. While there is some doubt as to the true order, the Laynesville coal and mouth of Mud creek coal will be here counted as the No. 1 coal. For the structure of these coals see figs. 21 and 22.

In the eastern part of the county the No. 1 coal starts up Johns creek about the high-water level and is thought to go under the creek bed in a few miles above the mouth of Daniels creek. But some good coals have been opened recently near the creek-level in the extreme eastern edge of the county on Johns creek that are hard to classify, if they do not belong to the horizon of the No. 1 coal. The coal is found all along the eastern side of the river valley, the same as on the western side.



The accompanying figures show the structure of this coal in various parts of the county.

In the extreme eastern edge of the county, between Mud and Hurricane creeks, on the south side of the river, the No. 1 coal was mined, in a large way, for several years, some thirty-five or forty years ago, and shipped in barges to the large cities on the Ohio river. The work was discontinued on account of the great loss of barges on snags and rocks and on account of the lack of



navigable stages of water during the summer and fall. The coal is reported to have been from 5 to 6 feet thick, with a large clay parting near the center. It is probable that the section from Mud creek, fig. 24, represents the coal fairly well.



*On Mud Creek, one mile above the mouth.*



*From Kentucky Geological Survey  
On Rock Fork of the Right Fork  
of Beaver Creek.*

The following analyses from the Kentucky Geological Survey Reports show the quality of this coal at several points. Very often a considerable portion of the seam is good splint coal, making a very desirable domestic and steam coal, and one that stands much rough handling, and one that stocks well.

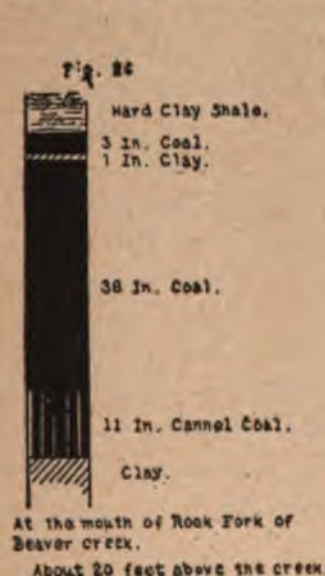
#### CANNEL COAL IN FLOYD COUNTY.

The cannel coals of Johnson county pass into Floyd county in undiminished thickness and quality, but they do not seem to be as widely distributed, or at least not as well known as in the first-named county.



On Abbotts creek the cannel coal is found in a number of places with a reported thickness of 20 to 24 inches, with about 24 inches of bituminous, splinty coal over it. In one place a thickness of 37 inches, without any bituminous, is claimed.

On Middle creek and its branches cannel coal has been found at several places widely separated, but no reliable information can be obtained except that it was thick enough to pay for working if there was any means of shipping it.



On Beaver creek the cannel coal at the mouth of Stone Coal branch has been described and shown in fig. 20. Another coal horizon was persistently reported on Beaver creek and its branches as being 300 or 400 feet up on the hills, but no openings could be found or heard of. It has been frequently exposed in landslides.

Cannel coal was also reported on the head of Prator creek and on the higher ridges around the heads of Mud and Toler creeks. It is probable that the cannel coal reported on Prator, Mud and Toler creeks may be the same cannel coal as opened on the land

of the Widow May, on Bear Fork, of Robinson creek, of Pike county, and described below. It may be, too, that the cannel coal reported on the Beaver hills belongs to this same horizon. The geological section has not yet been well worked out in this district, and the equivalency of coal horizons at distant points can not be stated with a very high degree of certainty.

On the eastern side of the Levisa Fork a few thin cannel coals have been found on Johns creek, and near Prestonsburg along the river. It is probable that the Daniels creek cannel coal extends up Johns creek, and that workable deposits will be found as the country is more thoroughly explored and prospected.

#### OTHER COALS OF FLOYD COUNTY, KY.

On Mud, Prator and Beaver creeks and its branches two other coals are very generally reported above the No. 1 coal besides the cannel coal. These coals have been opened in a few places in the past for trial and local use, but no openings could now be found where measurements could be made. In the high ridge around the head of Beaver a still higher coal was reported, but little could be learned about it. On Middle creek a 5-foot coal is very generally reported near the hilltops, but no openings could be found. It is probably the same as one of those reported around the head of Beaver creek.

On the eastern side of the county no coals of note are known but up Johns creek just across the county line in Pike county the hills carry a 4-foot and a 6-foot coal that ought to be found in the Floyd county hills.

#### QUANTITY OF COAL IN FLOYD COUNTY, KY.

The entire area of Floyd county, about 405 square miles, is drained by the Levisa Fork and its tributaries. The entire county can be called coal-producing territory, as nearly every farm has at least one workable coal vein and in a considerable portion of the county two workable veins are found in the same hill. The coal that can be gained and put in the markets is estimated



at 100 square miles, 4 feet thick. This makes 100 square miles by 4 feet by 640,000 tons, or 256,000,000 tons.

## ANALYSES OF FLOYD COUNTY COALS.

From the Kentucky Geological Survey Chemical Report, Vol. A, part 1, p. 248:

A. From Snipe's bank, on branch of Abbotts creek. About 2 feet shown. A splint coal.

B. From Harris' bank on Muddy creek, 1 mile from Prestonburg, coal 44 inches thick.

C. From J. H. Hatcher's bank at mouth of Abbotts creek. (See fig. 19.) From Kentucky Geological Survey Chemical Report, Vol. A, part 2, p. 186.

D. From mouth of Mud creek. Upper 18 inches of seam. (See figs. 22, 24.)

E. From same bed as D. Lower 3 feet 5 inches. (See figs. 22 and 24.)

F. Laynesville coal. Middle of the upper part of the opening, measuring 23 inches. A splint coal. (See fig. 21.)

G. From the same bed as F, lower portion measuring 45 inches. (Fig. 21.)

H. Coke made from sample F.

I. From mouth of Steel creek of Beaver creek. Average of the upper 4 feet of seam.

J. From Flemmings (or Jacks) creek, left fork of Beaver creek. Sample from a new outcrop of 5 feet 4 inches in thickness without the parting. Some clay unavoidable in the sample. A weathered sample of splint coal.

	A	B	C	D	E	F	G	H	I	J
Moisture .....	3.20	2.50	2.50	2.04	2.10	1.30	1.90	5.	2.50	3.80
Volatile matter	38.80	40.80	38.56	37.42	37.16	36.70	35.30	.....	32.50	33.80
Fixed carbon	55.04	56.70	53.44	56.34	57.74	51.70	58.94	88.50	56.54	60.60
Ash .....	2.96	3.24	5.50	4.20	3.	10.30	3.86	6.50	8.46	1.80
Sulphur .....	1.289	1.895	1.915	1.475	.596	1.356	.715	.788	.651	.475
Specific gravity	1.289	1.274	1.307	1.302	1.281	1.359	1.284	.....	1.323	1.350



## KNOTT COUNTY, KY.

The branches of Beaver creek extend over into Knott county and drain about 102 square miles of that county.

The No. 1 coal is mostly below drainage, but has a good thickness of 4 to 5 feet where it goes under. The cannel and higher coals referred to in the Floyd county description as being around the head of Beaver creek applies to this area in Knott county as well. This district has been prospected but very little, so that no details of the coals can be here given, but it is believed that the following estimate is well within limits: Twenty-five square miles of coal land with coal 4 feet thick gives—25 square miles by 4 feet by 640,000 tons or 64,000,000 tons.

## PIKE COUNTY, KY. (SOUTHERN PORTION.)

This large county is the most eastern county of Kentucky and bounds on both Virginia and West Virginia, and is drained by both forks of the Big Sandy river. The portion drained by the Levisa Fork and its branches is here described. The portion drained by the Tug Fork will be taken up later.

While it is not expected that the proposed slack-water navigation will extend clear through Pike county, it is considered that the entire coal field of the county is tributary to the river, and could furnish traffic to it by the construction of tramroads or cheap railroads of a few miles length up the larger streams. It is understood that this has been done on the Kanawha river. There seems no apparent reason why the slack-water improvement might not be extended into Virginia.

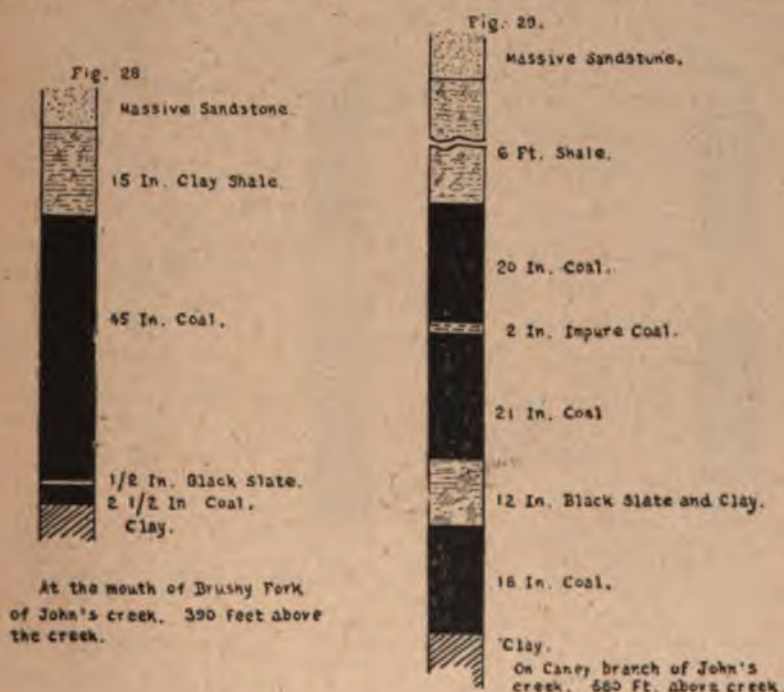
## JOHNS CREEK.

This large stream heads in Pike county, Ky., to the east of Levisa Fork and between that fork and the main dividing ridge between the waters of the Levisa and Tug Forks.

On Johns creek, at the mouth of Brushy Fork, in the extreme northwestern corner of the county, a "4-foot" coal has been opened and has the structure shown in fig. 28. This coal is 390'

feet above Johns creek, and has several hundred feet of hill over it. In the same hill six other coal veins were opened, but they were all thin, so that their sections are not given.

A few miles up Johns creek on Caney branch, on the lands of J. Harvey Leslie, "6-foot" coal is opened, and has the structure shown in fig 29. An analysis of this coal is given below. On this same land is found the iron ore described in the first part of this report. The "6-foot" coal is 580 feet above Johns creek, and



has about 300 feet of hill over it. In the same hill 7 other coals were opened, but they are all of no commercial value at this place, as they are either thin or full of thin partings.

On Bent branch of Johns creek, and about  $1\frac{1}{2}$  miles from Johns creek, the coal shown in fig. 30 is found near the creek level. The same coal is mined on Coon creek, a fork of Johns creek, for local use. An analysis of the Bent branch coal is given below.

The Kentucky Geological Survey gives an analysis (see below)



of a "50-inch coal" found on Stinking creek, a branch of Johns creek. No section nor its location in the hill is given.

Reports of other coals high in the hills around the head of Johns creek were heard, but no openings could be found. Inasmuch as considerable land on the head of Johns creek has been bought by coal companies as an investment, it is reasonable to suppose that there is good coal of merchantable value to be found there.



#### TRIBUTARIES ON THE NORTH SIDE OF THE LEVISA FORK.

At the western edge of the county, opposite the mouth of Mud creek, a coal about 75 feet above the river valley gave the section shown in fig. 31.

The Kentucky Geological Survey, in "A report on the South-eastern Kentucky coal field," publishes the following section of the hill at the mouth of Stone Coal creek, about 5 miles down the river from Pikeville:

At 560 feet above the Levisa Fork, coal 4 feet thick or more; cannel coal on top.



At 355 feet above the Levisa Fork, Gilliam's coal (fig. 32.)

At 200 feet above the Levisa Fork, coal 3 feet thick (fig. 33.)

At 140 feet above the Levisa Fork, coal 1 foot thick.

At 80 feet above the Levisa Fork, coal 2 feet thick.

The same Kentucky report as mentioned above also gives the following coal sections on Little Chloe creek opposite Pikeville. The coal in fig. 34 is 410 feet above the river, and that in fig. 35 is about 40 feet above the river. The latter coal is called the "Syck's" coal and is mined for use in Pikeville. Its analysis is shown below:

On Ferguson creek opposite Pikeville and just downstream from Little Chloe creek a coal is mined for use in Pikeville. It is 330 feet above the river and has from 400 to 500 feet of hill over it. Its structure is shown in fig. 36.

The following are analyses of Pike county coals taken from the Kentucky Geological Survey Chemical Report, Vol. A, part 3, pp. 189 and 193:

A. Coal from Leslie's land on Caney creek of Johns creek.

B. Coal from Bent branch of Johns creek.

C. Coal from Andrew Collins' land on Stinking creek of Johns creek.

Moisture .....	3.80	1.60	1.46
Volatile matter .....	28.	34.60	31.34
Fixed carbon .....	57.20	57.40	56.80
Ash .....	11.	6.40	10.40
Sulphur .....	.59	1.703	.727

The miners at this mine report two other workable coals in this same hill, one above and the other below, and both between 3 and 4 feet thick. Mr. William J. Love, an English mining engineer, in a special report on some Pike county coals to a coal company, speaks of the coal on Fergusons as a 7-foot vein, and gives the following analyses of the top and bottom benches. Mr.

Love also notes the Syck's coal on Little Chloe creek, and gives the following analysis of it. The analysis of the Syck's coal by the Kentucky Geological Survey is also given:

A. Top bench of coal on Fergusons creek. From Love's report.

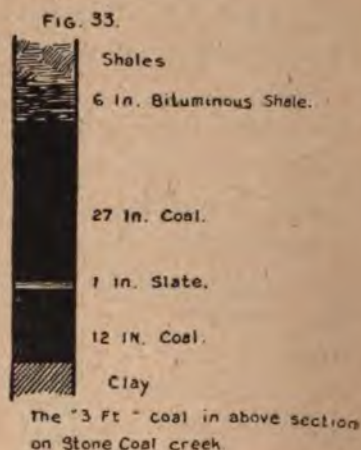


Fig. 32 is the Gillam coal in the above section on Stone Coal Creek.

Figs. 32 & 33 are from the Kentucky Geological Survey Report on the South-eastern Ky. Coal Field.

B. Bottom bench of coal on Fergusons creek. From Love's report.

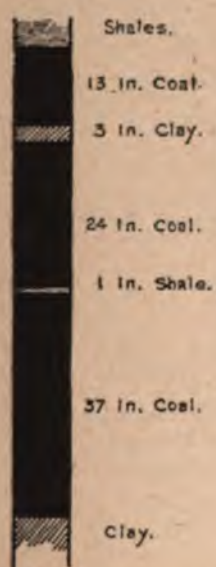
C. Syck's coal on Little Chloe creek. From Love's report.

D. Syck's coal on Little Chloe creek. From Kentucky Geological Survey.



	A	B	C	D
Moisture .....	1.60	1.68	2.46	5.06
Volatile combustible matter .....	41.	35.55	39.10	29.84
Fixed carbon .....	50.37	56.62	50.40	57.50
Ash .....	7.	6.10	8.	7.60
Sulphur .....	.03	.09	.04	1.04
Specific gravity .....				1.367

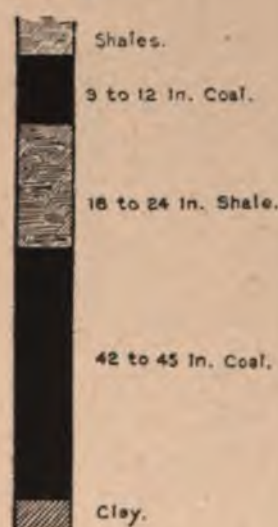
FIG. 34.



On Little Chloe Creek and  
410 feet above the Creek.

(From Kentucky Geological Survey.

FIG. 35



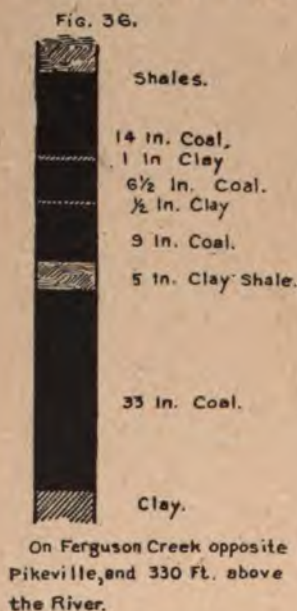
Sych's Coal, on Little Chloe Creek.  
About 50 feet above the Creek.

The thick coal on Fergusons creek has been traced and opened on the head of Little and Upper Chloe creeks and in the hills around the two Pompey creeks. No openings could now be found where the thickness could be measured, but the local reports seemed reliable and were very general and persistent. The special report of Mr. Love, above-mentioned, and also another



special report made by Mr. R. N. Dickman, a coal expert of Cleveland, Ohio, mentions this thick coal on the above-mentioned creeks and gives sections showing that it holds its thickness over a large area.

While this coal is from 300 to 400 feet above the river it has fully as much more hill over it in all the ordinary ridges and considerably more in the main ridges between the head of Johns creek and Tug Fork and the Levisa Fork. There is a very large acreage of this coal in this immediate district.



#### SPECIAL REPORTS TO PRIVATE COMPANIES.

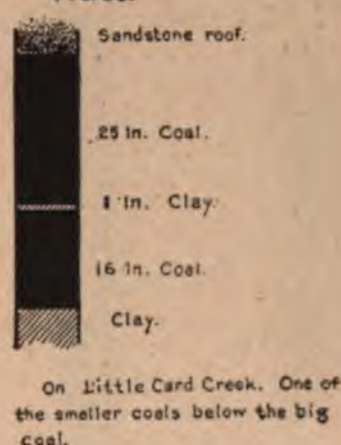
A word in regard to the special reports above referred to may be in order at this place, as they will be quoted again in reference to the Pike county coals. These reports are kindly furnished me by Mr. John C. C. Mayo, of Paintsville, Ky., and permission given to use such parts as found desirable. Many of the measurements of the thickness of coal seams were checked, but it was impossible to check all of them. Those checked were found to agree so closely with the reports that all are considered to be

thoroughly reliable. The analyses could not be checked except in a slight extent by a comparison with the few analyses of the Kentucky Geological Survey that happened to be from the same places. This comparison indicates that the analyses may also be taken as correct, because such differences as were found can easily be accounted for by local variations in the coal and from the fact that nearly all the coal samples from this region must be taken from the crop coal. These reports will therefore be quoted and credit given in each case.

FIG. 38.



FIG. 39.



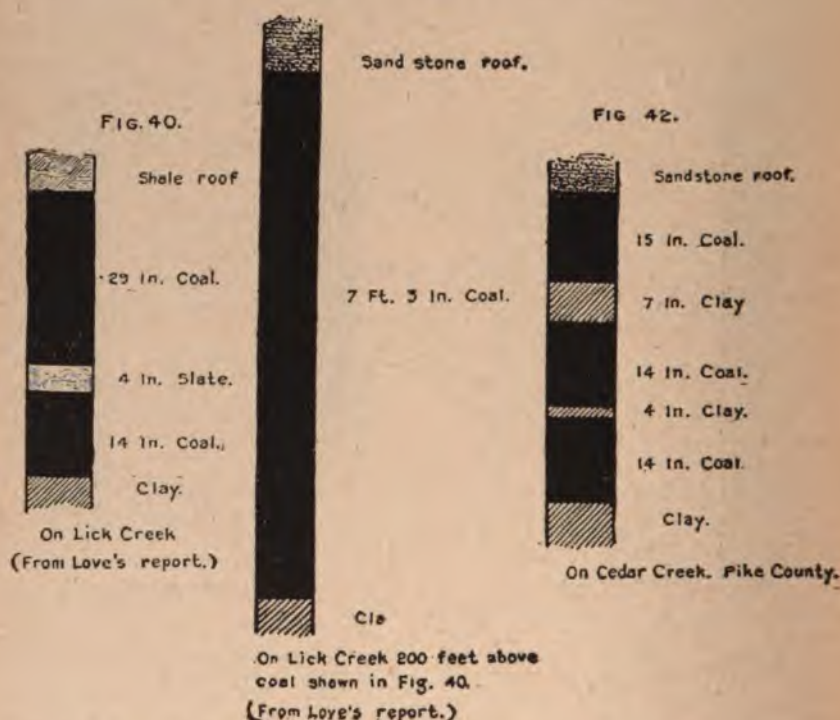
On the Levisa Fork, about 2 miles above the mouth of Russel Fork, a cannel coal has been exposed in a landslide, and has been roughly opened but not used, even locally. It could not now be measured on account of water, but Dickman's report gives the structure shown in fig. 37 and the following analysis:

Moisture .....	0.58
Volatile combustible matter .....	54.07
Fixed carbon .....	40.64
Ash .....	4.70
Sulphur .....	.87
Phosphorus .....	.011



On both sides of Levisa Fork and on most of the side tributaries from the mouth of Russel Fork to the State line between Kentucky and Virginia a thick coal, probably the same as mentioned on Fergusons creek and on the Chloe and Pompey creeks, is generally known, and has been opened in many places, usually by some of the coal companies that now own large tracts of this coal land. There are also two thinner coals, ranging from 3 to  $4\frac{1}{2}$

FIG. 41.



feet thick, very often reported and sometimes opened, one above and one below, as on Fergusons creek.

The thick coal has been opened on Grapevine, Lick, Big, Feds and both the Card creeks.

On Feds creeks the section shown in fig. 38 was measured. The coal is about 100 feet above the creek, and has from 600 to 800 feet of hill over it. On most of the streams the coal lies near the



streams, so that a very large percentage of the country holds the coal, and very little has been lost by the erosion of the creek valleys.

On Little Card creek one of the smaller coals, below the 6 or 7 feet coal, has the thickness and structure shown in fig. 39, and is about 150 feet above the stream. This big coal has been opened above in the same hill, but the opening is now closed with debris.

On Lick creek Love's special report gives the sections and analyses of two coals in the same hill and 200 feet apart. Fig. 40 shows the lower, which is probably the same as the lower coal on Little Card creek and shown in fig. 39. Fig. 41 is the higher coal, and is the thick coal so well distributed through this district.

## ANALYSIS.

Moisture .....	7.64
Volatile matter .....	44.85
Fixed carbon .....	39.87
Ash .....	7.60
Sulphur .....	.04

## ANALYSIS.

Moisture .....	6.28
Volatile matter .....	34.20
Fixed carbon .....	54.29
Ash .....	5.20
Sulphur .....	.03

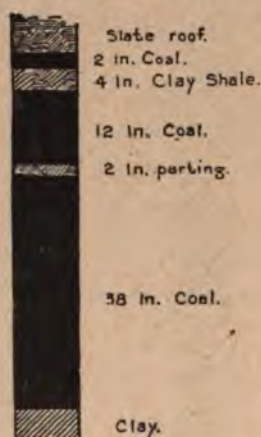
Prof. John R. Procter, State geologist of Kentucky, in a special report on lands in this region to a private company, says: "The Elkhorn seam, which is No. 3 of the section, has a fine development in this region. It is 86 inches thick near the mouth of Lick creek, 67 inches thick on Little Card creek, 74 inches thick on Big creek, and 63 inches thick on Ferrells creek (of Russel Fork.) Analyses show that the bed in this region maintains its excellent quality. Two hundred feet above the Elkhorn bed, on Ferrells creek, is a coal of fine quality 75 inches thick. Two hundred feet below the Elkhorn seam, on Big creek, a coal has been opened 48 inches thick. The hills rise to an elevation of about

1,000 feet above the Levisa Fork, and we have here a section of great value."

PIKE COUNTY SOUTH OF THE LEVISA AND RUSSEL FORKS.

Near the western edge of the county, on Cedar creek, two workable coals have been opened about 75 feet apart in the same hill and about halfway up the hill. The lower one could not be measured, but was reported as being about  $41\frac{1}{2}$  feet thick, with a

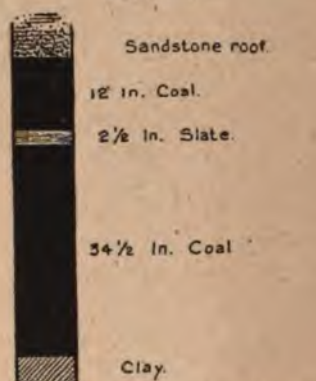
FIG. 43.



On Island creek, Pike Co.

(From Dickman's report.)

FIG. 44.



On Island Creek, Pike County

(From Dickman's report.)

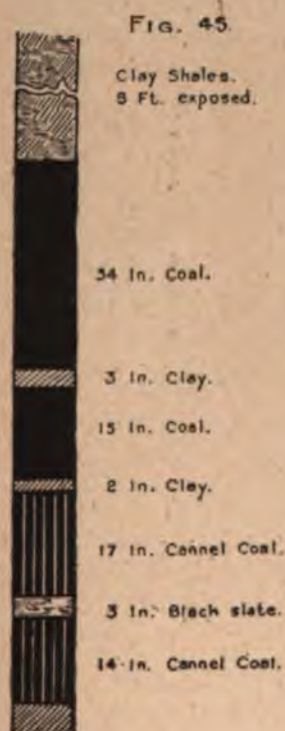
central parting of 5 inches. The upper one was measured, and its structure is shown in fig. 42.

On Hurricane creek, the next creek down the river, the lower coal is reported as full 5 feet thick with no partings. Four feet and six inches of clean coal was seen and measured, but the bottom of the coal was covered with water, so that a complete section could not be taken.

On Island creek, which enters the Levisa Fork about 2 miles above Pikeville, Dickman's special report gives the following sections, figs. 43 and 44, and analyses of two openings of the same coal a few miles apart, and both about 200 feet above the creek:



	Fig. 44	Fig. 43
Moisture .....	0.94	0.86
Volatile matter .....	42.55	38.57
Fixed carbon .....	53.39	55.67
Ash .....	3.10	4.89
Sulphur .....	.86	.70
Phosphorus .....	.103	.004



SHELBY CREEK.

Shelby creek and its numerous large branches drain a large basin which is very rich in workable coal.

On Bear Fork of Robinson creek, of Shelby creek, on the lands of the Widow May, a large coal seam is opened 750 feet above the



creek and has from 300 to 400 feet of hill over it. Fig. 45 shows the section as measured and fig. 46 shows the section of the same coal as published by the Kentucky Geological Survey.

The Kentucky Geological Survey gives the following section of a part of the hill containing the coal shown in figs. 45 and 46:

At 910 feet above creek: Coal stain, part cannel. Not opened.

At 770 feet above creek: Big coal; see figs. 45 and 46.

At 470 feet above creek: Elkhorn coal; see fig. 47.

At 420 feet above creek: Coal; see fig. 48.

On the left-hand fork of the Long Fork of Shelby creek the coal shown in fig. 49 was measured about 60 feet above the creek.

This is probably the same coal that is called the Elkhorn coal in the section of the Bear Fork hill. (See fig. 47 as given above from the Kentucky Geological Survey.)

This coal is very low on the hill on Long Fork and has been opened at many places and is known to cover a large area.

On Indian creek, about one-half mile above the mouth of Long Fork, Dickman's special report gives the following section, fig. 50, and analysis of a coal about 700 feet above the creek. This is probably the same as the thick coal on Bear Fork and shown in fig. 45:

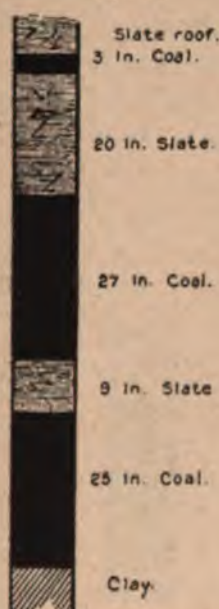
#### ANALYSIS.

Moisture .....	2.46
Volatile matter .....	38.02
Fixed carbon .....	56.91
Ash .....	2.61
Sulphur .....	.86
Phosphorus .....	.003

The Kentucky Geological Survey preliminary report on the Southeastern Kentucky coal field, page 18, gives the following analysis of William Hall's coal on Indian creek. Its position nor its section is not given:

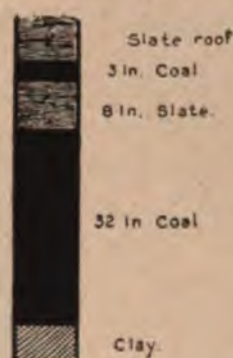
Moisture .....	0.60
Volatile matter .....	33.94
Fixed carbon .....	59.46
Ash .....	6.
Sulphur .....	.876

FIG. 47.



The Elkhorn coal in above section At 470 feet above Creek.  
(From Kentucky Geological Survey.)

FIG. 48.



Coal at 420 feet above the Creek in the above section.  
(From the Kentucky Geological Survey.)

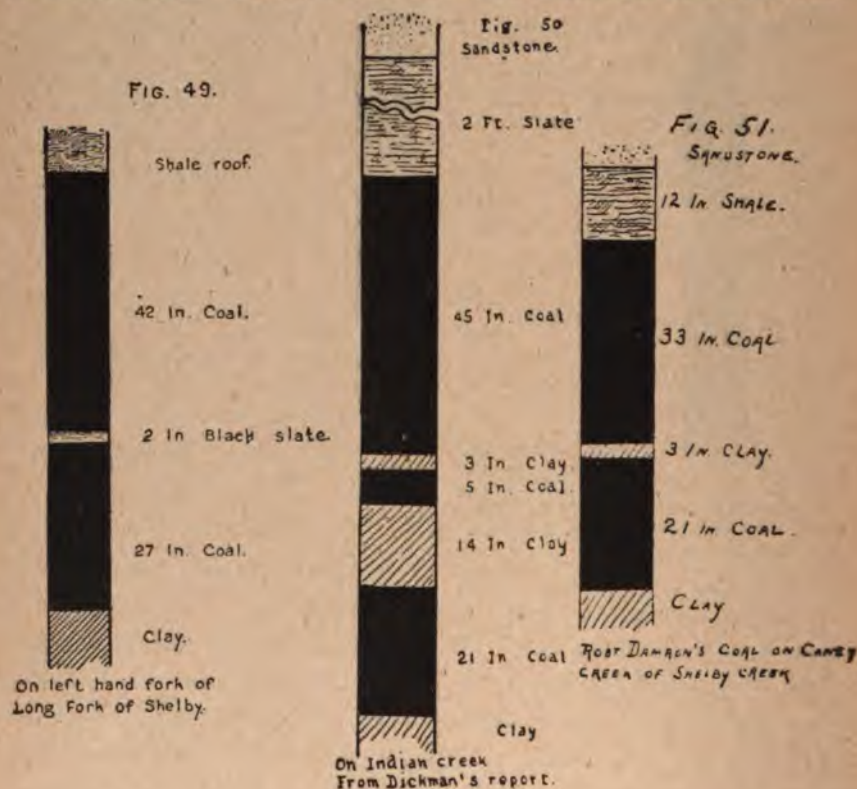
On Robert Damron's land on the left-hand fork of Caney creek of Shelby creek coal is opened in the bed of the stream, and was measured as shown in fig. 51. Enough coal to charge a coke oven was sent from this bank to Connellsville, Pa., to test its coking qualities. The resulting coke was pronounced to be of good quality. Dickman's special report gives the section of this coal shown in fig. 52, and the following analyses of the coal and cokes:

## ANALYSIS.

	Coal	Coke
Moisture .....	1.14	0.21
Volatile matter .....	39.37	.71
Fixed carbon .....	54.67	90.21
Ash .....	4.81	8.87
Sulphur .....	.75	.692
Phosphorus .....	.006	.009



Farther up the same Caney creek and about 2 miles from Damron's bank and about 500 feet up the hill a coal is opened on Daniel Robert's land, and has the section shown in fig. 53. Dickman's report gives this coal as 7 feet 9 inches thick, and gives the following analysis of it. Dickman calls this the Elkhorn coal:



## ANALYSIS.

Moisture .....	1.02
Volatile matter .....	39.96
Fixed carbon .....	55.03
Ash .....	3.98
Sulphur .....	.91
Phosphorus .....	.004

On John Smallwood's land on Dorton creek of Shelby creek, and about 300 feet up the hill, the coal shown in fig. 54 was measured.



Shelby creek and its branches, Dorton creek and Caney Fork, head in against the ridge dividing the Shelby waters from Elkhorn creek. This ridge on the Elkhorn side holds the famous Elkhorn coal in broad areas and great thickness, and forms a part of the territory known as the Elkhorn coal field. There is no question as to the extension of the Elkhorn coal through this ridge for many miles to the north into the Shelby basin.

Passing up the river from the mouth of Shelby creek to the Elkhorn creek, a branch of Russel Fork, we pass the mouths of Greasy creek, Marrowbone creek, Pond creek, and Moores branch, the principal streams that drain the triangular-shaped area between Shelby creek, Elkhorn creek and the river.

Much of this area has been thoroughly prospected in past years, and large tracts of it are now owned by companies who are awaiting transportation facilities to enable them to open mines and establish coking plants.

The old prospect openings are now fallen in so that no measurements could be obtained without much labor and time; but the fact that the land was purchased and is still held by persons who caused a thorough examination to be made shows that these are valuable coal lands.

Dickman's report gives the section shown in fig. 55 of a coal on Sycamore Fork of Marrowbone creek and the following analysis of the same:

## ANALYSIS.

Moisture .....	0.84
Volatile matter .....	41.87
Fixed carbon .....	52.15
Ash .....	5.12
Sulphur .....	1.86
Phosphorus .....	.011

No openings were found on Marrowbone at this time, but reports that seemed reliable were had of three workable coals in the hills located as follows:

At about 700 feet above the stream a 6-foot coal.

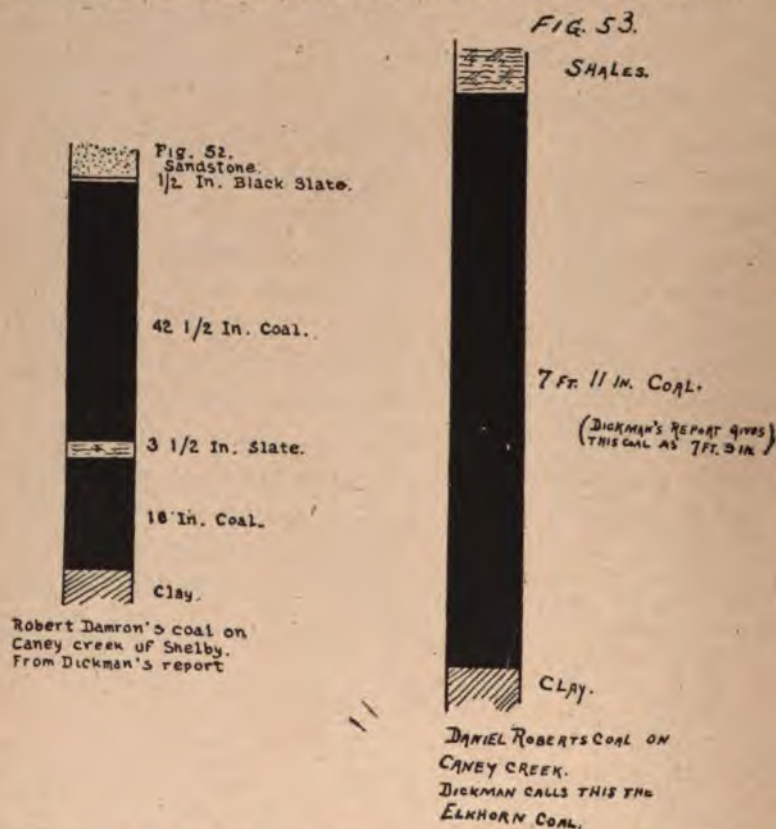
At about 300 feet above the stream a 4-foot 4-inch coal.

At about 100 feet above the stream a 4-foot coal.

None of these were seen.

Reports of good coals were also heard on Greasy creek, Pond creek and Jess branch.

Analyses of Pike county coals taken from the Kentucky Geological Survey Chemical Report, Vol. A, part 2, pp. 228 and 303:



A. Coal from Stone Coal creek,  $4\frac{1}{2}$  miles below Pikeville. Sample from upper 2 feet 8 inches.

B. Coal from same place as A but taken from lower, 3 feet of vein.

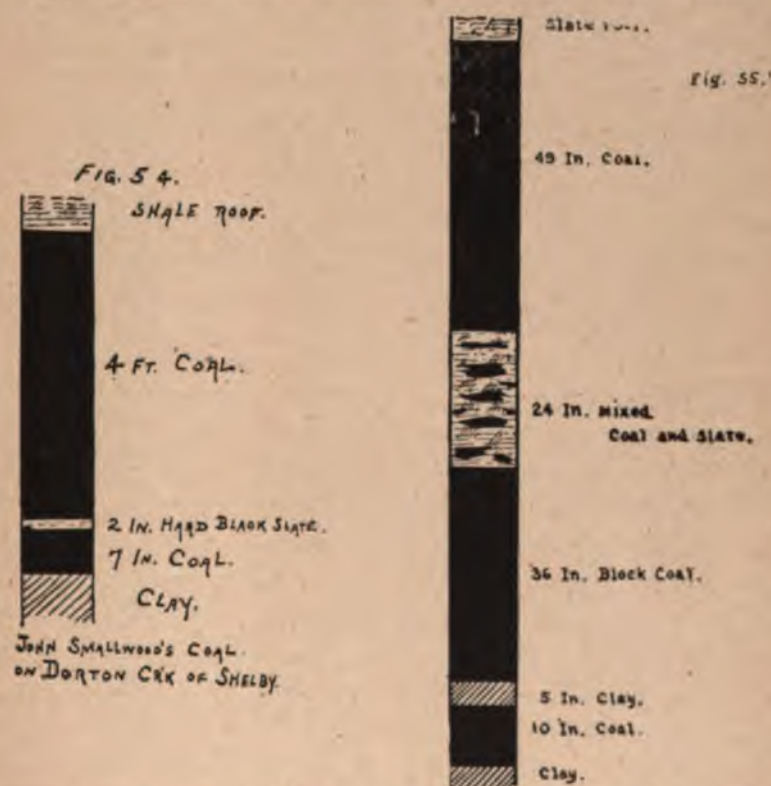
C. Coal from the head of Chloe creek,  $2\frac{1}{2}$  miles south of Pikeville. Average sample from the lower 4 feet 8 inches.



D. Coal from Big Rock Hollow, of Bear Fork, of Robinson creek, of Shelby creek, 40 or 50 feet above the 32-inch coal. Section of coal is: Top bench of 27 inches, clay parting of 9 inches, bottom bench of 25 inches. Sample from top bench.

E. Coal from bottom bench of same bank as D.

F. Coal from 32-inch seam mentioned in description of D.



G. Cannel coal from Widow May's land on Bear Fork of Robinson creek. Sample from 32-inch bed of cannel coal. (See fig. 46.)

H. Coal from William Hall's bank on the left-hand fork of Indian creek, about  $4\frac{1}{2}$  miles above where it flows into Shelby creek. Seams with sandstone roof and 48 inches thick.

I. Coal from Jackson Newson's bank on Robinson creek, 7 miles above where it flows into Shelby creek and 19 miles from



Pikeville. Section of seam is sandstone roof, top bench 15 inches, parting of 7 inches, middle bench of  $5\frac{1}{2}$  inches, parting  $1\frac{1}{2}$  inches to nothing, bottom bench of 24 inches. Sample includes all three benches, but not the partings. Splint coal.

	A	B	C	D	E	F	G	H	I
Moisture .....	2.20	2.40	1.40	0.40	0.40	1.60	2.	0.60	1.
Volatile matter .....	36.10	35.40	33.66	33.20	34.80	30.80	43.40	33.94	34.20
Fixed carbon .....	58.10	58.26	58.60	62.46	60.46	62.80	46.30	59.46	58.90
Ash .....	3.60	3.94	6.34	3.94	4.34	4.80	8.30	6.	5.90
Sulphur .....	.651	.692	.825	.642	.711	.555	.689	.876	.903
Specific gravity .....	1.279	1.293	1.273	1.294	1.273	1.310	1.293	1.294	1.311

#### THE ELKHORN COAL FIELD.

Elkhorn creek or river, as it is sometimes called, is a large stream flowing from Pound Gap in a northeasterly direction along the foot of Pine Mountain for a distance of over 20 miles, and emptying into Russel Fork of the Levisa Fork of Big Sandy river. The stream is parallel to and at no place more than 2 miles distant from the State line between Kentucky and Virginia, which here follows the crest of Pine Mountain. The drainage area of Elkhorn creek is all in Kentucky and all in Pike county, except about 20 square miles around the head of the creek, which is in Letcher county, Ky., and which will here be described with Pike county.

The Elkhorn coal has probably attracted more attention than any other coal of the Big Sandy Valley, with the possible exception of the Johnson county cannel coals. It has been studied by the geologists of the Kentucky Geological Survey, and their work is embodied in the report of that survey. The coal field has also been visited by many coal experts and geologists in the interest of private parties and companies who had purchased or were contemplating the purchase of tracts of coal lands.

The district has been quite well prospected, considering its

distance from railroads, general inaccessibility, rough topography and objectionable reputation that has unfortunately been attributed to its most hospitable inhabitants. The coal has been thoroughly tested as to its coking qualities by both small and large samples sent to coking plants, and by open piles at the place where dug. The coal is generally accepted as a fine coking coal, and its reputation and value is based upon this property.

Fig 34.



Large tracts of land in this valley are now held by companies who are waiting for a means of transportation to enable them to open large mines and coking works. The coal on the head of the creek can best reach the river by a short railroad through Shelby Gap and down Shelby creek to the river.

The Kentucky Geological Survey report on the Pound Gap region says that this coal is "probably the most important in the Pound Gap region, better known on Elkhorn creek, in Pike county, than elsewhere. In the Big Stone Gap region, in Virginia, this



bed is known as the Imboden seam. It is also known as the 'coking coal' of that region, a designation which is applicable in the Pound Gap region from the coking qualities of the coal, as will be seen from such preliminary tests as have already been made. The area of the Elkhorn coal in its recognized character includes, in a general way, the head waters of Elkhorn and Shelby creeks, in Pike county; of Beaver creek, in Floyd county and Knott county, and portions of the head of the Kentucky river." Beginning at the head of Elkhorn creek, in Letcher county, and just under Pound Gap, sections and analyses of the coal will be given in order toward the mouth of the creek. The sections are from my own measurements, the Kentucky Geological Reports, and special reports at hand. The analyses are from the various reports entirely, as circumstances did not permit having any analyses made at this time.

On H. H. Nochol's land, near the head of Elkhorn creek, in Letcher county, at an opening known as the "Mullins" bank, the section in fig. 56 was measured at creek level. The Kentucky Geological Survey gives the same coal as in fig. 56, and the following analysis of it:

## ANALYSIS.

Moisture .....	2.60
Volatile matter .....	34.20
Fixed carbon .....	60.80
Ash .....	2.40
Sulphur .....	.412
Specific gravity .....	1.282

On Alec Isam's land, on the west side of Elkhorn creek, between Peaks branch and Joes branch, in Letcher county, and about 80 feet above the creek, the section in fig. 57 was measured.

On Peaks branch of Elkhorn, in Letcher county, the Kentucky Geological Survey gives the section as shown in fig. 58.

On the left fork of Marshalls branch of Elkhorn, Letcher county, the Kentucky Geological Survey gives the section in fig. 59.

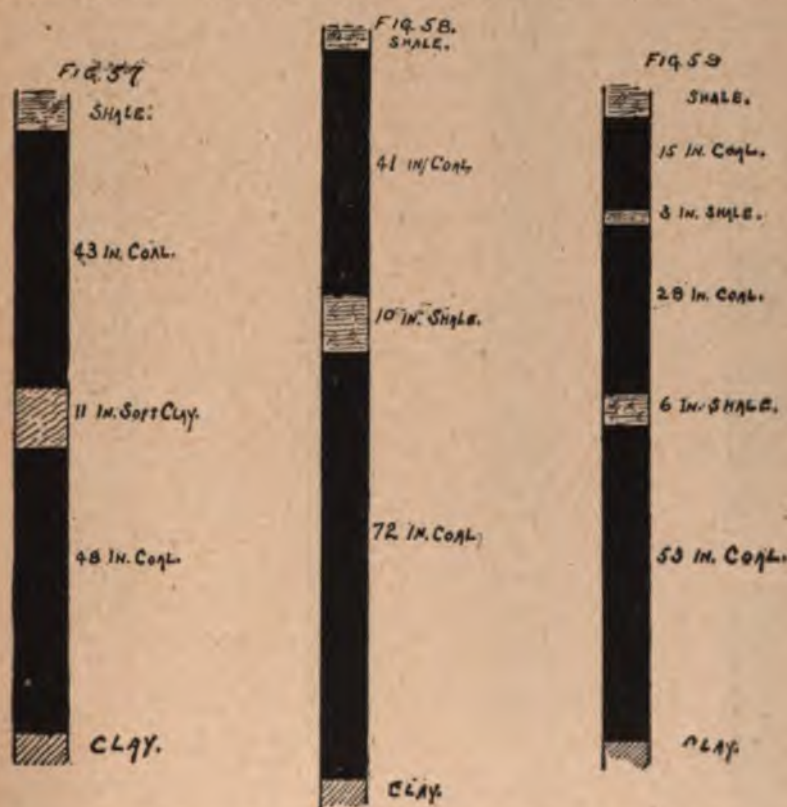
On the main part of Marshalls branch of Elkhorn creek, on



the land of George Adams, Dickman's report gives the section in fig. 60 and the following analysis:

## ANALYSIS.

Moisture .....	1.24
Volatile matter .....	38.84
Fixed carbon .....	58.65
Ash .....	1.26
Sulphur .....	.64
Phosphorus .....	.004



The Kentucky Geological Survey gives the section in fig. 61 as from the right fork of Marshalls branch, Pike county, and the section in fig. 62 as from Cane branch of Elkhorn, just east of Shelby Gap, and the following analyses of the two benches of the Cane branch coal:

## ANALYSES OF CANE BRANCH COAL.

	Upper	Lower
Moisture .....	6.	2.54
Volatile matter .....	31.26	32.26
Fixed carbon .....	59.34	62.20
Ash .....	3.40	3.
Sulphur .....	.390	.547

Fig. 60.

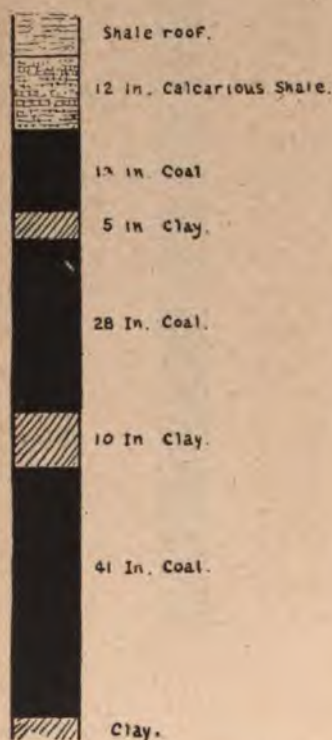


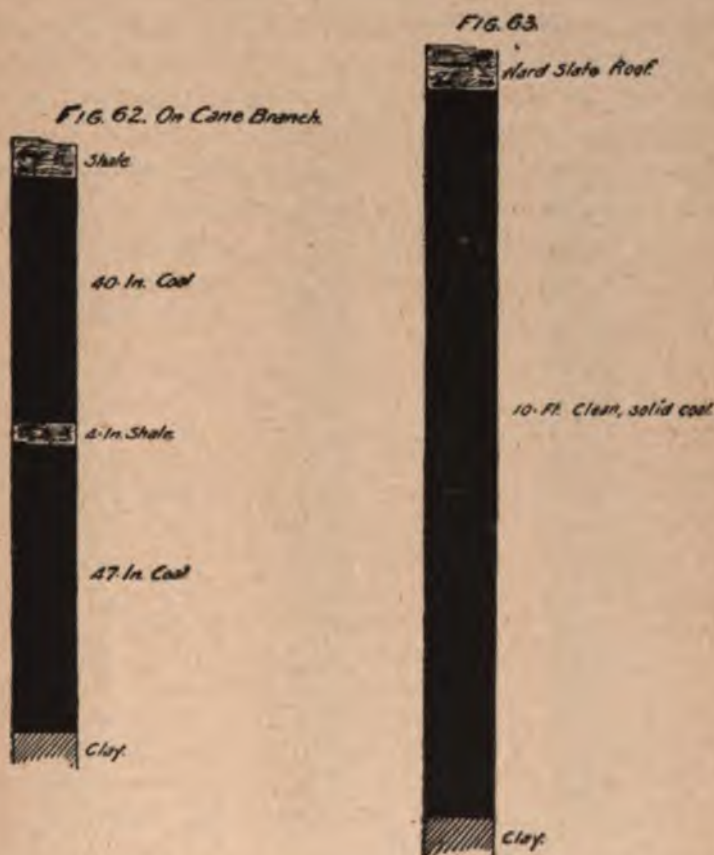
FIG. 61 On Marshall's Branch



One mile up Pigeonroost branch of Elkhorn creek Dickman's report gives the section in fig. 63 as being at the creek level.

He also gives the following analysis of the coal:

Moisture .....	1.06
Volatile matter .....	37.91
Fixed carbon .....	58.79
Ash .....	2.23
Sulphur .....	.76
Phosphorus .....	.004



On Sycamore branch of Elkhorn creek a coal is opened about 100 feet above the creek level that is reported to be 10 feet thick, but the opening was so obstructed that a complete section could not be made at present. Nearly 7 feet of clean, solid coal, with no partings, was exposed and measured, but the bottom was covered with water and debris.

The Kentucky Geological Survey shows the section in fig. 64 as



from Ben branch of Elkhorn creek, Pike county, and the section in fig. 65 as being on Benjamin Potter's land.

On a small branch on the east side of Elkhorn creek, just opposite the mouth of Ash Camp creek and along the trail going over Ash Camp in Pine Mountain, the coal is opened at 300 feet above the stream. It has a strong local dip of about 9 per cent. to the northwest, and the coal and roof is badly crushed, broken, and twisted, showing the effects of the great movements that took place at the formation of Pine Mountain.

Dickman's report gives the section shown in fig 66 as belonging to this opening and the following analyses of the coal. When this bank was visited only 7 feet of coal, without partings, was exposed above the water in the mines. No doubt the measure given by Dickman is correct.

## ANALYSIS.

	Coal	Coke
Moisture .....	0.60	0.16
Volatile matter .....	39.22	.10
Fixed carbon .....	58.	92.46
Ash .....	2.16	7.46
Sulphur .....	.90	.581
Phosphorus .....	.005	.008

Following are analyses of Pike county coals taken from Kentucky Geological Survey Chemical Report, Vol. A, part 2, p. 225:

## ELKHORN COALS.

A. On Big Elkhorn. Seven feet bed with a 2-inch parting 6 inches above the middle. Average of whole bed.

B. From Isaac Patton's new bed on branch, head of Elkhorn creek. Two feet thick or more.

C. On big Elkhorn creek at Mullens branch, head of Ken-

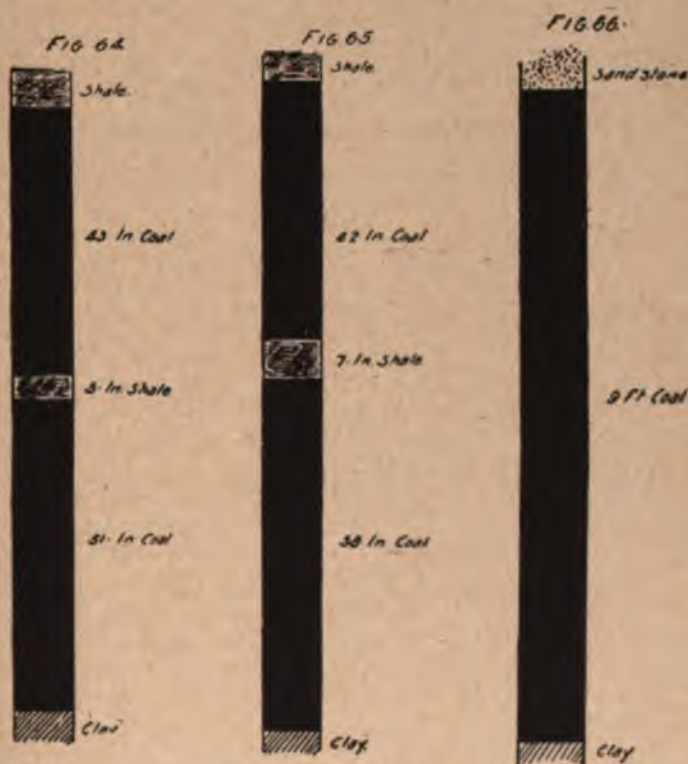
tucky river. Bed nearly 4 feet thick. Average sample of lower part.

D. Rice's coal on Mill branch of Elkhorn creek. Whole thickness, 101 inches. This sample from lower 44 inches.

E. From same bed as D, but from upper part of bed.

F. Coke made from Rice's coal, same bed as samples D and E.

G. Coke made of the Elkhorn coal in an oven in Cincinnati, Ohio.



H. Slack coal from Elkhorn creek for coking test at Connellsville, Pa.

I. Coke made from H at Connellsville, Pa., by inclosing the coal in a wooden box, nailed up and putting it in the midst of the Connellsville coal in a coking oven.

J. Coal from Cane branch of Elkhorn creek. Sample from the upper 5 feet 5½ inches above the 6-inch parting.



K. Coal from same bed as J. Sample from the lower 3 feet 7 inches.

L. Coke from coal taken from upper part of seam from William Mullen's bank on Elkhorn creek.

M. Coke made from mixed samples of coal from same bank as L. It is probable that samples L and M are from the same bank as sample C.

	A	B	C	D	E	F	G
Moisture .....	2.60	2.60	2.	1.60	1.60	2.86	0.20
Volatile matter .....	34.20	33.40	33.50	32.10	29.36	.....	.....
Fixed carbon .....	60.80	61.30	60.54	64.64	67.40	88.44	93.20
Ash .....	2.40	2.70	3.96	1.66	1.64	8.70	6.60
Sulphur .....	.412	.467	.429	.711	.610	.844	.734
Specific gravity .....	1.282	1.307	1.271	1.278	1.271	.....	.....
	H	I	J	K	L	M	
Moisture .....	1.80	1.20	6.	2.54	1.10	1.06	
Volatile matter .....	26.80	.....	31.26	32.26	.....	.....	
Fixed carbon .....	67.60	94.14	59.34	62.20	95.40	90.40	
Ash .....	3.80	4.66	3.40	3.	3.50	8.54	
Sulphur .....	.967	1.484	.390	.547	.517	.598	
Specific gravity .....	.....	.957	1.355	1.314	.....	.....	

On Ash Camp creek the coal has been opened and found to be of good thickness, but could not now be measured. From Ash Camp to the mouth of Elkhorn no openings were seen nor are any sections at hand from other reports. Local reports that seemed to be reliable stated that the coal maintained its thickness and quality to the river, but was there high in the mountains.

Prof. John R. Procter, director of the Kentucky Geological



Survey, gives the following general section of the coal measures as applying to the Elkhorn region:

Coal No. 7: Eighty inches thick. Interval from 275 to 350 feet.

Coal No. 6: Robinson creek coal of Pike county. A thick coal. Interval from 150 to 175 feet.

Coal No. 5: "Upper splint," 36 to 80 inches thick. Frequently a cannel coal. Interval from 100 to 150 feet.

Coal No. 4: "Lower splint," 36 to 83 inches thick. Frequently a cannel coal. Interval from 130 to 175 feet.

Coal No. 3: Elkhorn coal or main coking coal, 63 to 96 inches thick. Interval from 70 to 120 feet.

Coal No. 1: Coal from 36 to 60 inches thick.

Professor Procter also says in regard to certain lands of about 50,000 acres in the Elkhorn coal field:

"No. 3 being near the base of the hill underlies the greater portion, excepting the slight area removed by erosion, and as the hills are high enough to include most of the section (given above) and in places all of the section, it would be a safe estimate to assume that three-fourths of the property will include all of the coals, including No. 7. The Kentucky Geological Survey has demonstrated the fact that as many as eight beds of coal of good thickness are found above drainage in Pike county; that several of these coals are unexcelled by any because of purity, thickness and cheapness of mining. From one of these beds (named the Elkhorn seam) a coke superior to the Connellsville composition and equal in strength and physical structure, can be produced."

QUANTITY OF COAL IN PIKE AND LETCHER COUNTIES DRAINED BY THE  
LEVISA FORK.

The area of Pike county drained by the Levisa Fork, is about 567 square miles. To this will be added 20 square miles in Letcher county, making a total area of 587 square miles.

There are few parts of this area that do not hold at least one workable coal of good thickness in its hills and in many places three are known over wide areas.

It is thought that it will be very conservative to estimate one-third of the total area as holding 6 feet of clean merchantable coal can be mined and shipped. This estimate gives the following: 587 square miles by 13 by 6 feet by 640,000 tons, or 751,360,000 tons.

BASIN OF RUSSELL AND LEVISA FORK IN VIRGINIA.

The Levisa Fork and its main branch, Russell Fork, extends into Virginia and drains an area of about 833 square miles located in the counties of Wise, Dickenson, and Buchanan. This area is mountainous, heavily wooded, thinly populated, and not reached by railroads.

While this district is above the contemplated slack-water navigation improvement it was desired that something be learned of its minerals. A hasty tour was therefore made through the northern part of Dickenson county and the western part of Buchanan county to gather such information as was available. As a rule the people have given no thought to such matters, and very little is locally known as to the thickness and extent or number of coal seams in the district and nothing at all as to the iron ores and clays, nor has there been any prospecting for minerals by outside parties, as has been done in Kentucky and West Virginia.

In many neighborhoods a coal would be opened where the local blacksmith and a few families would get their fuel. In some places two seams would be known and opened. The coals seen ranged in thickness from 3 to 6 feet and some of them were fine bituminous coal. A few large coal blossoms were seen in the hill roads and trails, but time could not be taken to investigate them as to thickness.

It is safe, I think, to predict that there are large areas of workable coal in this district which will be found and mined in a large way for the general markets some time in the future. Just across the dividing line to the southeast of these streams are at present large mines that ship a large output by railroad.



No attempt has been made to make an estimate of the coal of this district, principally because it is too far above the proposed river improvement, and secondly, because of the meager data for such an estimate.

#### SUMMARY OF QUANTITY OF COAL ON THE LEVISA FORK.

Gathering the estimates made for the various counties, we have an estimate of the number of tons of coal that may be expected to come down the Levisa Fork Valley before that coal field is exhausted:

	Tons.
Lawrence County .....	55,296,000
Johnson County .....	419,840,000
Floyd County .....	256,000,000
Knott County .....	64,000,000
Pike County .....	} 751,360,000
Letcher County .....	
Total .....	1,546,496,000

This number is so vast that one can not grasp its meaning without some kind of comparison. For this purpose the following few statistics have been gathered from the most convenient sources.

From the Report of the Inspector of Mines of Ohio for 1896, the following is taken:

Amount of coal (including anthracite) shipped up the Great Lakes from Ohio, Pennsylvania, Maryland, and West Virginia:

	Tons.
During 1890 .....	5,200,449
During 1891 .....	6,016,331
During 1892 .....	7,596,812
During 1893 .....	7,773,580
During 1894 .....	6,869,257
During 1895 .....	7,318,234
During 1896 .....	8,914,327
Average of the seven years .....	7,098,429

If we assume that this trade has or will grow to, say, 10,000,000 tons per year, we see that the Levisa Fork has enough coal to supply the entire lake trade for over one hundred and fifty years.



From the Report of the Chief Engineers for 1895, p. 2091, Maj. W. H. Heuer gives the following as the total shipment of coal from Pittsburg, Pa., down the Ohio river in boats and barges:

	Tons.
During 1886 .....	3,483,232
During 1887 .....	2,155,702
During 1888 .....	4,174,376
During 1889 .....	2,589,639
During 1890 .....	3,420,357
During 1891 .....	2,893,752
During 1892 .....	2,299,294
During 1893 .....	2,364,401
During 1894 .....	2,453,787
During 1895 .....	2,393,873
Average of the ten years .....	2,822,841

If we assume the coal shipped on the river from Pittsburg to be 6,000,000 tons per year, we see that the Levisa Fork could supply this trade for over two hundred years.

If it should be thought that the estimates given for the various counties are too large, it is seen that they may be reduced by a large per cent. and still show an enormous quantity of coal in this valley. It is believed that those best acquainted with the valley will criticise this report because the estimates are made as small as they are, but it is thought best to err on this side.

#### TUG FORK.

Tug Fork of the Big Sandy river drains an area of about 1,600 square miles located in the three States of Kentucky, Virginia, and West Virginia. Of this area about one-half may be considered as coal territory tributary to the proposed slack-water navigation improvement which is now proposed to extend a short way above Williamson, W. Va.

That portion of this tributary area located in West Virginia is now mostly within reach of the Norfolk & Western railroad, which follows the east bank of the river from Naugatuck, at the mouth of Pigeon creek, to its head. The portion in Kentucky can also be reached from this railroad, but expensive bridges would be

required to cross the river for each branch road, which will delay the development of this territory.

The detailed description of the area and the estimates of the quantities of coal will be taken up by counties, as on the Levisa Fork.

#### LAWRENCE COUNTY, KY.

This county does not hold any coals of importance in the portion drained by the Tug Fork. There are local reports of several small coals along the river, but none were opened so that measurements could be made of them. Judging from the coals on the Levisa Fork, and taking the dip into consideration, none of the best coals are to be expected on the Tug Fork. There may be local thickenings of the thin veins which may pay to work in a large way, but none are now known.

No estimate will be made of the coal that may be obtained from this county.

#### WAYNE COUNTY, W. VA.

The quantity and quality of the coal in this county is very little better than in the last county described. The southern and eastern parts of the county have some coal of value and adjoin good coal territory of other counties. The extreme southern end of the county reaches to Sand Bar Bend of the river, where the Warfield coal disappears under the river to the north. It is probable that a considerable area of the Warfield coal can be reached by shaft in the southern end of the county.

Jennies creek heads with Marrowbone creek of Mingo county against the waters of Twelve Pole creek. On both Marrowbone and Twelve Pole thick coals are known, which ought to be found on the waters of Jennies creek.

On account of the lack of data no estimate will be attempted for Wayne county, although it is very probable that the Warfield coal will be worked in a large way within its limits.



## MARTIN COUNTY, KY.

This comparatively small county is all drained by the Tug Fork and mostly by two large creeks, branches of Tug—Wolf creek and Rock Castle creek.

In the northern end of the county the Peach Orchard coal has been located just across the ridge from the mines in Lawrence county. It is claimed that the thickness is the same as at the mines, but no openings were found where measurements could be made. For a section of the Peach Orchard coal see figs. 4 and 5.

On Stafford Fork of Rockhouse Fork of Rock Castle creek and opposite the heads of White House and Greasy creeks the thick coal shown in fig. 7 is found in the tops of the ridges and extends along the ridge to the south for several miles.

On the heads of Rockhouse Fork and Middle Fork of Rock Castle creek a very large tract of land has been held for several years by persons who made a thorough examination of the lands for coal. The E coal shown in figs. 14 and 17 is on this tract and is considered the most valuable of the several coals found. The following section of the hills on this tract has been well established:

Coal No. F: From 11 to 12 feet thick. See fig. 7. Interval, 135 feet.

Coal No. E: From 5 to 6 feet thick. See figs. 14 and 17. Interval, 65 feet.

Coal No. D: From 9 to 11 feet thick. Full of thin clay partings and not counted of much value. Same as Peach Orchard seam. Interval, 85 feet.

Coal No. C: Averages about 4 feet thick. Interval, 40 feet.

Coal No. B: Averages about 3 feet 6 inches thick. Interval, 75 feet.

Coal No. A: Averages about 4 feet 9 inches thick. At creek level on this tract and thought to be the No. 1 coal of the Kentucky Geological Survey, but not well determined, and some well-informed persons think that the No. 1 or Warfield coal is still below the No. A coal of this section.

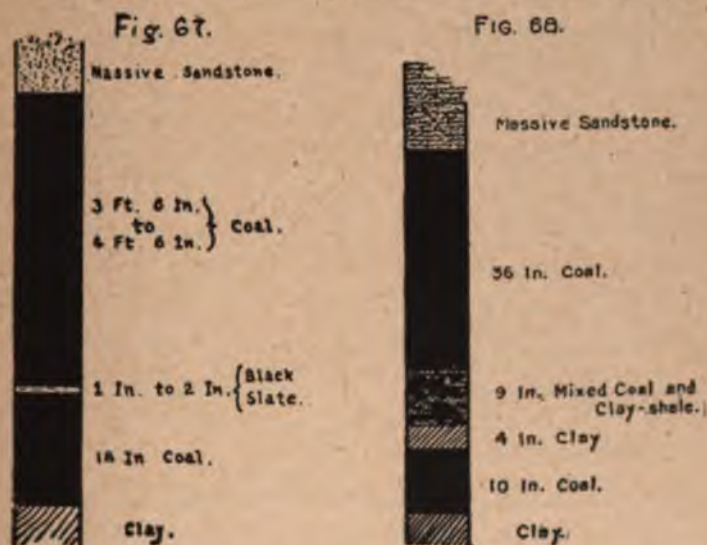
The E coal is the most important and has been well prospected



and proven to extend over a large area with its usual thickness and quality. The following analysis is from the owners of the lands:

Moisture .....	3.54
Volatile matter .....	31.36
Fixed carbon .....	56.30
Ash .....	8.80
Sulphur .....	.565

Well-informed persons think that this E coal can be mined from at least 50 per cent. of the area included in a district 6 miles wide and 14 miles long in the western edge of Martin county. In the hills around Eden (Inez post office), in Rock Castle creek, two coals



are known, and one of about 4 feet thick is worked for the local supply.

#### WARFIELD COAL.

At the village of Warfield, on the Tug Fork, a fine seam of coal crops out very prominently at many places and has been mined in a small way for many years. At one time it was mined for the manufacture of salt and to supply the small steamboats on the river.

The coal is about 40 feet above the river bed at Warfield and dips both ways. Downstream it goes under the river at Sand Bar Bend, about 3 miles from Warfield, and upstream it goes under the river at the mouth of Wolf creek, about  $2\frac{1}{2}$  miles from Warfield.

It is found in or near the bed of Wolf creek for a few miles up that creek.

At Warfield it was measured as shown in fig. 67.

The following analyses show the composition of the Warfield coal and another coal 150 feet above it:

A. Warfield coal.

B. Warfield coal.

C. A 42-inch coal 150 feet above the Warfield coal.

	A	B	C
Moisture .....	2.73	2.47	1.46
Volatile matter .....	34.78	34.18	32.60
Fixed carbon .....	59.18	55.03	62.68
Ash .....	3.07	8.32	3.26
Sulphur .....	.24	1.17	.....

#### WOLF CREEK.

This large creek drains a large basin that has not been so well prospected, so that neither the thickness nor extent of the coals is well known. The few openings and creditable reports that were noted showed that at least one good workable coal is found quite generally through this Wolf Creek Valley. From the reports this coal closely resembles the E coal of Rock Castle creek or a 5-foot coal on the head of Big creek of Pike county, Ky., and described below.

Going up Tug Fork above the mouth of Wolf creek reliable reports were heard of a coal ranging from 5 to 6 feet thick opposite Naugatuck, at the mouth of Pigeon creek, West Virginia. It is



probably the same as a coal found near Naugatuck on the West Virginia side of the river.

#### QUANTITY OF COAL IN MARTIN COUNTY.

The data for an estimate of the available coal of Martin county is not as abundant nor as definite as desirable, but it is thought that it is safe to say that at least one-fourth of the entire area of the county can be counted as holding 4 feet of coal that can be mined and shipped. This gives the following: Total area of 236 square miles by  $\frac{1}{4}$  by 4 feet by 640,000 tons equals 151,040,000 tons.

#### PIKE COUNTY, KY.

[Northern part. Drained by the Tug Fork.]

This portion of Pike County is drained by the following large creeks, all tributaries of the Tug Fork: Beginning at the northern edge of the county and going to the Virginia line we pass the mouths of Big creek, Pond creek, Blackberry creek, Peter creek, and Knox creek; Knox creek also drains a large area in Virginia.

The high, broad ridge against which these creeks head and which divides the waters of the Levisa and Tug forks, together with the big ridges dividing the creeks one from another, have been fairly well prospected in the past. The prospect holes have now filled up so that very little can be learned by visiting them, so that most of the information regarding this region has been obtained from the citizens of the district and from the mining engineers and prospectors who examined the lands for coals. Large tracts of lands are now owned by companies that had these examinations made, which fact is a good indication of the presence of valuable deposits of coal.

The same big coal found on Feds creek (see fig. 38), Big creek of Levisa Fork, and Lick creek of Levisa Fork (see fig. 41) comes through the ridge in its full thickness, being from  $5\frac{1}{2}$  to 7 feet thick on the heads of Peter creek, Blackberry creek, and Pond creek. On the head of Road Fork of Big creek of Tug Fork, at an



elevation of about 300 feet above the creek, a large coal blossom was seen in the road, but no opening was found where it could be measured. It was reported to be from 5 to 7 feet thick. It was probably the blossom of the thick coal above referred to. At the creek level of the same Road Fork the coal shown in fig. 68 was measured on Pinson's land.

On the ridges between and on either side of Blackberry and Peter creeks, the extension of the noted Thacker coal of West Virginia has been fully identified and found to be about 6 feet thick over a considerable area. The relation of the Thacker coal and the thick coal on the Levisa Fork side of the dividing ridge on Feds creek, Lick creek, etc., has not been worked out; they may be the same or there may be two of these large coals to be found in these hills.

In the same ridges where the Thacker coal has been identified on Blackberry and Peter creeks a 4-foot coal is found from 40 to 60 feet below the Thacker coal.

The Thacker coal and the 4-foot coal both lie low in the hills and cover a large percentage of the total area over a large district. On the head waters of Pond creek the thick coal is found with two others below it in the same hills. On Turkey creek, about 2 miles below Williamson, W. Va., is found a thick coal full of thin partings and with 21 inches of cannel coal in it, at 340 feet above the creek. The same cannel coal is also found on Long Fork or Big creek of Tug Fork. On Frog Pond branch, a small creek between Turkey creek and Big creek, three workable coals are found, one being near the creek level.

#### QUANTITY OF COAL IN PIKE COUNTY, KY.

##### (On the Tug Fork Watershed.)

From all information that could be gathered, it seems conservative to estimate 40 per cent. of the total area as holding 5 feet of coal that can be mined and shipped. The area of Pike county drained by Tug Fork is 226 square miles. The amount of coal is then 226 square miles by 0.40 by 5 feet by 640,000 tons, or 289,280,000 tons.

**Quantity of Coal in the Tug Fork Valley Tributary to the Proposed River Improvement.**

	Tons.
Lawrence County, Ky. ....	Not estimated.
Wayne County, W. Va. ....	Not estimated.
Martin County, Ky. ....	151,040,000
Pike County, Ky. (northern part) .....	289,280,000
Mingo County, W. Va. ....	230,400,000
Total .....	670,720,000

Stating this quantity in the same units as used for the Levisa Fork, we see that the Tug Fork could maintain the coal trade up the Great Lakes for sixty-seven years, or could maintain the Pittsburgh shipments on the river for over one hundred years.

**Summary of Quantity of Coal on the Two Main Forks of the Big Sandy River Tributary to the Proposed Improvements.**

	Tons.
On Levisa Fork .....	1,546,496,000
On Tug Fork .....	670,720,000
Total .....	2,217,216,000

This quantity is so great that it may be thought that the estimates have been too liberal, but if it be discounted even 50 per cent. there is still left a quantity almost beyond conception. But it is thought that the estimates have been quite conservative and that the quantity of available coal in these valleys is much more than above stated.

The estimate of 1,000 tons of coal for each acre of coal 1 foot thick is at least 20 per cent. below what is now obtained in many coal fields, and it is probably 25 per cent. below what can be obtained with the best modern methods of mining.

The estimates of acreage and thickness of seams is much less than what is claimed by many persons thoroughly acquainted with the field, some of whom are not in any way interested in its development.

Very respectfully submitted,

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Assistant on the Ohio Geological Survey.



## LAWS RELATING TO MINING, ETC.

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### THE MINING LAW.

AN ACT to provide for and regulate the ventilation of coal mines in this State and for the better protection of miners, enacted by the General Assembly of 1891-3, and amended at the session of 1894.

*Be it enacted by the General Assembly of the Commonwealth of Kentucky:* § 1. That there shall be appointed by the Governor with the advice and consent of the Senate, an Inspector of Mines, who shall hold his office for four years, and until his successor is appointed and qualified; but he shall be liable to be removed by the Governor for willful neglect of duty or malfeasance in office. Any vacancy in the office of Inspector which may occur when the Senate is not in session shall be filled by appointment by the Governor till the close of the next session of the Senate. Said inspector shall have a practical knowledge of chemistry, geology and mineralogy, and shall also possess a practical knowledge of the different systems of working and ventilating coal mines, and of the nature and properties of the noxious and poisonous gases of the mines, especially fire-damp, and he shall also have a practical knowledge of mining and engineering; and said inspector shall, before he enters upon the discharge of his official duties, be sworn to discharge them faithfully and impartially, which oath shall be subscribed on his commission, and certified by the officer administering it, and his commission so indorsed shall be filed with the Secretary of State in his office; and said Inspector shall give a bond in the penal sum of five thousand dollars, with surety, to be approved by the Governor, for the faithful discharge of his official duties.

§ 2. Said Inspector shall give his entire time and attention to the discharge of the duties of his office, and it shall be a part of his



duty to visit and inspect, as often as may be necessary, all the coal mines in actual operation in Kentucky and to see that the provisions of this act are complied with by the owners, agents and superintendents of all the mines in this State.

§ 3. Said Inspector shall have power to visit and inspect any mine to which this act applies. He shall examine into the condition of such mine with respect to ventilation, drainage, timbering and general security; and if, upon inspection he finds that such ventilation, drainage, or timbering as the health or safety of the persons employed in the mine would require has not been provided, or should he find the mine insecure in any part, or should he find that sufficient means of ingress and egress have not been provided, said inspector shall at once notify the agent, superintendent or owner of the mine as to the unsafe or unwholesome condition of such mine, and require him to put the mine in a safe and wholesome condition, and such mine shall forthwith be rendered safe and healthful. For a failure to comply with the directions of the Inspector to render such mine safe, and to provide such ventilation as is sought to be secured by this law, and to provide safe and suitable means of ingress and egress within twenty days from the date of inspection, the agent or superintendent and owner shall be liable to a fine of fifty dollars per day for every day that such mine shall be suffered to remain in such unsafe or unhealthful condition after the expiration of the twenty days above provided in which the required improvements should be made, which fine may be collected by indictment by the grand jury of the county in which such mine is situate; but in cases in which the Inspector is satisfied, from personal investigation, that, even if due diligence is observed, the required improvements can not be completed within the twenty (20) days above provided, he shall have authority to extend the time for not more than twenty days longer; but when the time is thus extended, the agent, superintendent or owner who is delinquent after the expiration of the additional time, shall be subject to indictment and fine as above provided; and as a cumula-

tive remedy in case of failure of any owner, agent or superintendent to conform to the provisions of this law, after notice from the Inspector, within the time provided by this section, any circuit court, or the judge in vacation, may, on application of the Inspector, by civil action, in the name of the State, enjoin or restrain, by writ of injunction, the said owner or agent or superintendent from working or operating such mine with more than five persons until it is made to conform with the provisions of this law. But before such writ of injunction shall issue, the owner, agent or superintendent shall have at least three days' notice of such contemplated action, and shall have the right to appear before such court, or the judge in vacation to whom the application is made, who shall hear the same on affidavits and such other testimony as may be offered in support, as well as in opposition thereto. It shall be the duty of the Commonwealth's attorney of the district, and of the county attorney of the county in which the mine lies, to prepare and prosecute proceedings upon said application. [This section is in accordance with amendment approved March 3, 1894.]

§ 4. The Inspector of Mines shall keep an office in the State House at Frankfort. He shall be provided with all necessary stationery, to be supplied by or through the State Librarian as other offices are supplied; and he shall keep a record of all the inspections made by him and shall furnish a certified copy of his report of the inspection of any mine inspected by him to the Commonwealth's attorney of the district in which the mine is situated, on application therefor, which copy shall be admissible in evidence in any court in this Commonwealth, and shall be *prima facie* evidence of the truth of recitals therein contained.

§ 5. Such inspector while in office shall not act as agent, or as a manager or mining engineer for, or be interested in operating any mine, and he shall annually, on or before the tenth day of February, make report to the Governor of his proceedings for and during the calendar year ending on thirty-first day of December, and of the condition and operation of the coal mines in this State, enu-



merating all accidents which shall have occurred in or about the same, and giving such other information as he may deem useful, and making such suggestions as he may deem important as to further legislation on the subject of mining. The Inspector shall also report the number of persons employed in and about the mines, and the amount of coal mined; and, for the purpose of enabling him to make such report as is required by this section, the owner, lessee, agent, or superintendent of every mine to which this law applies is hereby required to give, each month, accurate information, on blanks to be furnished by the Inspector, as to all accidents occurring in or about the mines, the number of persons employed, and the amount of coal mined during the preceding month; and the owner, lessee or superintendent refusing or failing to furnish the Inspector such information for sixty days after application therefor has been received, shall be liable to a fine of fifty dollars, to be recovered in the county in which the mine concerning which such information is refused is situated. The inspector is authorized to extend his observations, so as to be prepared to report upon the mining possibilities and mineral resources of the counties to which he is called in the prosecution of his duties as Inspector. One thousand copies of the Inspector's annual report shall be printed for general distribution.

§ 6. The Inspector shall receive an annual salary of eighteen hundred dollars, payable monthly, and shall likewise be allowed and paid his necessary traveling expenses when absent from his office on business connected with his department; and he shall keep on file in his office maps and plans of all coal mines in operation in this State, which maps, plans, and all the books, records, and apparatus of his office, he shall carefully keep and turn over the same, with all official correspondence pertaining to his office, to his successor; and upon application of the owner, agent, lessee, or superintendent therefor, he shall make out a duplicate of any map on file in his office of any mine owned or operated by the owner, agent, lessee, or superintendent making such application, for the making of which duplicate a fee of five dollars must



be paid, and which fee shall, within thirty days after its reception, be paid into the State Treasury by the Inspector receiving it.

§ 7. There shall be provided for said Inspector all instruments and chemical tests necessary for the discharge of his duties under this law, which shall be paid for on the order of the Inspector, and which shall belong to the State.

§ 8. The owner, agent, lessee or superintendent of every coal mine in this State, to which this law applies, shall annually, within sixty (60) days after the first day of January, make or cause to be made, an accurate map or plan of the workings of such mine, on a scale of not more than one hundred feet to the inch, showing the area mined and the form of the excavations up to the said first day of January, together with the location and connection with such excavations of the lines of all adjoining lands, and the name or names of each owner or owners so far as known, marked on each tract; a true copy of which map the said owner, agent, lessee or superintendent shall deposit with the Inspector of Mines within seventy days after said first day of January, and another copy of which shall be kept at the office of such mine. But, after the making of and filing with said Inspector of the first map of the mine, as required herein, the owner, agent, lessee or superintendent, shall only be required to annually make and file with said Inspector, within the times herein specified, such additional map and statement as may be necessary to truly show the progress of the workings and the amount of excavation of said mine from the date of the preceding map or survey up to the first day of January as provided herein. The Inspector shall annually, on or before the first day of January, give warning notice that said map is required; and upon the refusal or failure of the agent, owner, lessee or superintendent receiving such notice, to make, or cause to be made, such map within the sixty (60) days, and deposit the same with the Inspector within the seventy (70) days, specified herein, said owner, agent, lessee or superintendent shall be liable to a fine of five dollars (\$5) a day for each day elapsing until said map is made, said fine to be recovered in the county in which the

mine to be mapped is situated. The correctness of each map provided for by this section shall be certified to by the person making such map; and the Inspector may reject any map as incomplete, the accuracy of which is not so attested.

§ 9. It shall not be lawful for the owner, agent or superintendent of any coal mine, worked by a shaft, slope or drift, wherein fifteen thousand square yards have been excavated, to employ more than ten persons to work therein, or to permit more than ten persons to work in such mine, unless there are to every seam of coal worked in each mine at least two separate outlets, separated by natural strata of not less than one hundred feet in breadth, by which shafts or outlets distinct means of ingress and egress are always available to the persons employed in such mines; but it shall not be necessary for the two outlets to belong to the same mine; and every shaft opened after the passage of this act shall have two such separate outlets after fifteen thousand square yards shall have been excavated; and to all other mines, whether slopes or drifts, two such openings or outlets shall be provided within twelve months after the passage of this law, provided fifteen thousand square yards have been excavated at or before the passage of this law, or if not, then within twelve months after that extent has been excavated. In case any coal mine has but one shaft, slope or drift for the ingress or egress of the men working therein, and the owner thereof does not own suitable ground for another opening, such owner may select appropriate associate adjacent surface ground for that purpose, and have the same condemned, and appropriate the same by proceedings in the county court of the county where the mine is situated, similar to proceedings now allowed by law for securing a private passway.

§ 10. The owner, agent, or lessee of every coal mine, whether slope, shaft or drift to which this act applies, shall provide and maintain for every such mine an amount of ventilation of not less than one hundred cubic feet of air per minute per person employed in such mine, which shall be circulated and distributed throughout the mine in such a manner as to dilute, render harmless, and expel



the poisonous and noxious gases from each and every working place in the mine, and no working place shall be driven more than sixty feet in advance of a break-through or air way; and all break-throughs or air ways, except those last made near the working face of the mine, shall be closed up and made air-tight by brattice, trap doors, or otherwise, so that the currents of air in circulation in the mine may sweep to the interior of the excavations where the persons employed in the mines are at work; and all mines governed by this statute shall be provided with artificial means of producing ventilation, such as suction or forcing fans, exhaust steam, furnaces, or other contrivances of such like capacity and power as to produce and maintain an abundant supply of air. All mines generating fire-damp shall be kept free from standing gas, and every working place shall be carefully examined every morning with a safety lamp, by a competent person or persons, before any of the workmen are allowed to enter the mine. And at every mine operated by a shaft there shall be provided an approved safety-catch, and a sufficient cover overhead, on all cages used for lowering and hoisting persons, and at the top of every shaft a safety-gate shall be provided, and an adequate brake shall be attached to every drum or machine used in lowering or raising persons in all shafts and slopes.

§ 11. Any person employed in any mine governed by this statute who intentionally or willfully neglects or refuses to securely prop the roof of any working place under his control, or neglects or refuses to obey any order given by the superintendent of the mine in relation to the security of that part of the bank where he is at work and whoever knowingly and wilfully does any act endangering the lives or health of the persons employed in a mine or the security of the mine or machinery, shall be liable to a fine of not less than ten dollars nor more than fifty dollars, to be recovered in the county in which the mine is situate.

§ 12. Coal mines in which not more than five persons are employed at one time shall be exempt from the provisions of this law.



§ 13. On account of the emergency hereby declared to exist, in that it is necessary for the employes in mines to receive the protection of the provisions of this law in timely season, this law shall be in force from its approval by the Governor.

Approved February 15, 1893.

#### **CURATOR OF GEOLOGICAL DEPARTMENT.**

EXTRACT from Resolution 61 of General Assembly of 1891-92-93, as amended in Chapter 78 of Acts of General Assembly of 1894.

1. That the Inspector of Mines, in addition to his duties as such Inspector, shall be Curator of the Cabinet and other property of the Geological Survey or Department, and all the records, documents, collections, instruments, apparatus, books, maps and other property of the Survey are hereby confided to his care and keeping; and, as such Curator, he is hereby required to attend to all correspondence and respond to all requests concerning the mineral resources of the State that come to him in his said capacity; to attend to the distribution of all published maps and reports in his hands intended for distribution, and to perform all the duties usually devolving upon such a Curator, so far as is applicable in this case; and he shall whenever the General Assembly shall direct and provide therefor, cause to be printed under his supervision, any or all of the unpublished reports of the Geological Survey that may be in his custody. He shall be allowed and paid fifty dollars per month as compensation for his services as such Curator, and shall give bond for the faithful performance of his duties as such Curator, with surety to be approved by the Governor.

**ASSISTANT INSPECTOR.**

AN ACT to increase the efficiency of the Inspector of Mines, and more fully provide for the protection of the lives and health of persons employed in the coal mines of this State, enacted by the General Assembly of 1891-92-93. Approved December 3, 1892, and June 9, 1893.

*Be it enacted by the General Assembly of the Commonwealth of Kentucky:* § 1. Every mine subject to the provisions of the act providing for the inspection of the coal mines, shall be inspected not less than three times each year, the inspection to be, as nearly as possible, not more than four months apart, and as many more times as the facilities of the office will permit.

2. In order that the requirement of section one above may be carried out, there shall be appointed by the Governor, with the advice and consent of the Senate, an Assistant Inspector of Mines, who shall hold his office for four years; but shall be liable to be removed by the Governor for willful neglect of duty or malfeasance in office. Said Assistant Inspector shall have a practical knowledge of the different systems of working and ventilating coal mines, and of the nature and properties of the noxious and poisonous gases of mines, especially of fire-damp, and he shall also have a practical knowledge of mining. Said Assistant Inspector shall before entering upon the discharge of his official duties be sworn to discharge them faithfully and impartially, which oath shall be subscribed on his commission and certified by the officer administering it, and his commission so indorsed, shall be filed with the Secretary of State in his office, and said Assistant Inspector shall give bond in the penal sum of two thousand dollars, with surety, to be approved by the Governor, for the faithful discharge of his official duties.

3. Said Assistant Inspector shall give his entire time and attention to the duties of his office, which shall consist of aiding, under the direction of the Inspector of Mines, in carrying out the provisions of this and all other acts relating to the inspection of coal mines.



4. Such Assistant Inspector, while in office, shall not act as agent or as a manager or mining engineer for, or be interested in operating any coal mine in this State. He shall receive an annual salary of \$1,200 (twelve hundred dollars), payable monthly, and shall likewise be allowed and paid his necessary traveling expenses when absent from his office on business connected with his department. He shall have his office with the Inspector of Mines in the State House at Frankfort, and shall keep a record of all inspections made by him, and make a monthly report of the same to the Inspector of Mines for said Inspector's use when preparing his annual report.

5. (As amended and approved June 9, 1893.) For the reason that the number of mines in this State, subject to the law requiring inspection is now so great that it is impossible for one person charged with the duties of Inspector of Mines to give all of them the immediate, detailed and frequent attention they require, and, in addition, discharge the other duties of his office, an emergency is hereby declared to exist, and this act shall be in force from its approval by the Governor; and the term of said Assistant Inspector of Mines provided for herein, and his salary, shall begin only with the date of his appointment.

(Act went into effect June 9, 1893.)

#### **TO PROVIDE FOR A CHECK-WEIGHMAN.**

Chapter 1251 of Acts of General Assembly of 1885-86.

*Be it enacted by the General Assembly of the Commonwealth of Kentucky:* § 1. That when a majority of the miners engaged in digging or mining coal at any coal mine in this State, at which as many as twenty men are employed, request the owner or owners, or operator or operators, of any of said mines to allow said miners to employ, at their own expense, a person to inspect the scales at said mine, and see that all the coal digged and mined by



said miners is properly weighed and accounted for, and do and perform such other duties as will insure that said coal is properly weighed and correctly accounted for, said owner or owners, or operator or operators, shall permit such person to be employed by said miners making the request: Provided, The person so employed has the reputation of being an honest, trustworthy, discreet and upright man. The appointment, under the provisions of this act of each Inspector and assistant weigher, shall be approved by the judge of the county court of the county wherein the same is made.

2. The person appointed and employed by miners to perform the duties set forth in the first section of this act shall, at all times, have free access to the scales at the mines, and the said person so employed by the miners shall not be hindered or prevented from a proper performance of his duties by the person who weighs coal for the operator or operators of any mines, nor any of the agents or employes of said operator or operators. Said person employed by the miners shall in no way prevent the weighman or other employes of said operator or operators from performing their duties in a proper manner.

§ 3. Any person violating any of the provisions of this act shall be fined not less than ten nor more than fifty dollars, and each day on which any of the provisions of this act is violated shall constitute a separate offense.

§ 4. This act shall take effect and be in force from and after its passage.

Approved May 18, 1886.

[By oversight this law was omitted from the Kentucky Statutes compiled by Barbour & Carroll, 1894.]

**ROADS FOR MINES.**

Section 815, Kentucky Statutes, 1894.

§ 815. Any person engaged in operating a mine or stone quarry within three miles of any navigable stream or railroad may, for the purpose of transporting material to and from such stream or railroad, and such mine or quarry, construct and operate a line of railroad from such mine or quarry, to the most convenient and accessible point on such stream or road, and may, under the general laws, condemn such land as may be necessary, not exceeding fifty feet in width for each track necessarily constructed, and not exceeding two acres of land at such railroad or stream for the purpose of necessary buildings. The owner or operator of such roads shall be, so far as they are applicable, governed and controlled by the laws relating to other railroads, and shall have the same rights and privileges granted to corporations owning and operating lines of railroad.

**WAGES—PAYMENT IN MONEY—STATUTORY REQUIREMENT—CONSTRUCTION.**

Kentucky Statutes, Chapter 36, Section 1350—Wage-earners—Penalty for Not Paying in Money.

That any corporation or person or persons having the ownership or control of any factory, mine or workshop in this Commonwealth, who shall violate the provisions of sec. 244 of the Constitution, reading as follows: "All wage-earners in this State employed in factories, mines, workshops, or by corporations shall be paid for their labor in lawful money," shall be guilty of a misdemeanor, and, on trial and conviction, had in any court of competent jurisdiction, shall be fined not exceeding five hundred dollars for each violation thereof.



Kentucky Statutes, Chapter 36, Section 1386—Notes of Incorporated Banks Only to be Circulated.

It shall not be lawful to make, offer to pay, or to pass or offer to pass any note, bill, order or other thing passing by delivery, as a circulating medium, in lieu of or as the representative of money, unless it be the note or bill, of not less than five dollars, of some banking institution legally incorporated in the United States, or currency of the United States. If a note, bill, order or other such thing, be of the denomination of less than five dollars, it shall be presumed to have been made, paid or passed, or offered in violation of this section unless the contrary be shown.

#### CONSTRUCTION.

*Case in Point.*—The Avent Beattyville Coal Co., Lee county, was convicted of not paying its wage-earners in lawful money, and appealed. Reversed.

*In Brief.*—A mining company paid its employes once each month in lawful money for the past month's labor, and at any time during the month, upon their application, issued checks to them, payable in merchandise at the company's store. The amount of checks so issued to each man was deducted from his wages on every pay-day and he was paid the balance in cash, but no money was paid for outstanding checks. Held—That such arrangement was not in violation of Constitution, section 244, and Stats. of Ky., section 1350, providing that wage-earners shall be paid for their labor in lawful money. (Opinion delivered by Judge Hazelrigg, December 1, 1894. Published in full in Report for 1894.)

#### SESSION 1898.

AN ACT concerning employees and servants in mining work or industry in this Commonwealth.

*Be it enacted by the General Assembly of the Commonwealth of Kentucky:* § 1. That all persons, associations, companies and corporations employing the services of ten or more persons in any



mining work or mining industry in this Commonwealth, shall, on or before the sixteenth day in each month, pay for the month previous, such servant or employe, on his or their order, in lawful money of the United States, the full amount of wages due such servant or employe rendering such service. But if such person, corporation or company, after using due diligence, is unable to make said payment as above required, he or it shall, within fifteen days thereafter, make out a pay-roll and statement of amount due each employe, and also a due bill for said sum, bearing interest from said sixteenth day of the month, and deliver same to each of said employes.

§ 2. It shall be unlawful for any person or persons, association, company or corporation employing others, as described in section 1, either directly or indirectly, to coerce or require any such servant or employe to deal with or purchase any article of food, clothing or merchandise of any kind whatever, from any person, association, corporation or company, or at any place or store whatever. And it shall be unlawful for any such employers as described in the first section, to exclude from work, or to punish or blacklist any of said employes for failure to deal with any other, or to purchase any article of food, clothing or merchandise whatever, from any other or at any place or store whatever.

§ 3. Any person or persons, company or corporation described in the first section that shall violate any of the provisions of this act shall be guilty of a misdemeanor, and on conviction shall be fined not less than fifty dollars nor more than one hundred dollars for each offense, and the doing or failure to do any act or thing required by this act shall constitute a separate offense.

J. C. WICKLIFFE BECKHAM,  
*Speaker of House of Representatives.*

W. J. WORTHINGTON,  
*President of Senate.*

Became a law without the Governor's approval, he having failed to sign or return it to the House in which it originated within the time prescribed by the Constitution.

CHAS. FINLEY,  
*Secretary of State.*

## CHAPTER 15.

AN ACT concerning the employes and servants in mining work or industry in this Commonwealth.

*Be it enacted by the General Assembly of the Commonwealth of Kentucky:* § 1. That all persons, associations, companies and corporations employing the service of ten or more persons in any mining work or mining industry in this Commonwealth, shall on or before the sixteenth day of each month pay for the month previous such servant or employe on his or their order in lawful money of the United States the full amount of wages due such servant or employes rendering such services. But if such person, corporation or company, after using due diligence, is unable to make said payment as above required he or it shall within fifteen days thereafter make out a payroll and statement of amount due each employe and also a due bill for said sum bearing interest from said sixteenth day of the month, and deliver same to each of said employes.

§ 2. It shall be unlawful for any person or persons, association, company, or corporation employing others, as described in section one, either directly or indirectly, to coerce or require any such servant or employe to deal with or purchase any article of food, clothing or merchandise of any kind whatever, from any person, association, corporation or company, or at any place or store whatever. And it shall be unlawful for any such employers as described in the first section to exclude from work or to punish or blacklist any of said employes for failure to deal with any other or to purchase any article of food, clothing or merchandise whatever from any other or at any place or store whatever.

§ 3. Any person or persons, company or corporation described in the first section that shall violate any of the provisions of this act shall be guilty of a misdemeanor and on conviction shall be fined not less than fifty dollars nor more than one hundred dollars for each offense, and the doing or failure to do any act or thing required by this act shall constitute a separate offense.

Received by the Governor, March 2, 1898.

Became a law at the expiration of ten days without the Governor's approval.















